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Beta Haemolytic Streptococcus Infection in Dogs*

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This paper is based on an analysis of 400 cases which I have investigated clinically and bacteriologically. In the earlier part of our field studies, about ten years ago, the owners of breeding kennels showed no liking for the words *beta haemolytic streptococcus*. They coined the convenient abbreviation "B.H.S." and I adopted it.

The B.H.S. infection is highly contagious, widely prevalent and endemic throughout the British Isles. It has been reported in U.S.A., France, Germany, Italy, and recently in India by Professor Minett. Important contributory factors are overcrowding and human inertia. I have observed the B.H.S. infection in many varieties of dog of either sex and of all ages from foetal life to senility; but the *initial* B.H.S. illness usually occurs within the first two years. As measured by contact infection, the incubation period in dogs over weaning age varies from two to seven days; usually it is four days.

The common mode of infection is by the inspiration or aspiration of droplets of mucus from a patient's pharynx or the excretions of infected tissues, such as vaginal exudate and urine. The frequent isolation of the B.H.S. from the tonsils or pharynx of whelps, which have died within three days of birth, and from the vagina of the dam, suggests transmission via the infected vaginal exudate during parturition, though it may also derive from post-natal licking by the dam. I have been unable to satisfy myself that the exudate of the specific eruptions or the exfoliated epidermis are infectious. The dog's habit of licking complicates the bacteriological investigation of the body surface and appears to be the explanation of the occasional successes in isolating the B.H.S. from skin lesions or from the teats of suckling dams. Autoinfection through licking probably accounts for the frequent presence of the B.H.S. in the preputial mucus. A second mode of infection is by the inoculation of the tissues as in injuries, surgical operations, licking of the navel of whelps by the infected dam and autoinfection by licking. Thirdly, from autopsy findings the intrauterine death of foetuses appears to be due to absorption of B.H.S. toxin *in utero*. Fourthly, venereal spread has yet to be proved. Though a sire's prepuce and a bitch's vagina may be shown to be infected, we should avoid words which might lead clients to infer that venereal infection at service had in fact occurred; the medico-legal implications are obvious.

PATHOGENESIS

The tissues are injured as a consequence either of (*a*) direct invasion by the B.H.S., or (*b*) absorption of its toxin. The illness may be both an infection and an intoxication, but in the large majority of cases over weaning age it is predominantly, even exclusively, an intoxication. Whatever the site of entry of the organisms, direct invasion of the tissues results in (1) septicaemia; (2) intermittent passive conveyance of the B.H.S. by the blood (pyaemia) with localization particularly in kidneys, gums, uterus and serous membranes; or (3) extension along lymphatics and tissue spaces producing lymphadenitis, lymphangitis or cellulitis.

Absorption of toxin results in injury to the endothelium of the capillaries. In life this is readily observed in the capillaries of the submucosae, sclera and skin as congestion, transudation of oedema fluid and leakage of blood. Absorption of toxin also produces degeneration of the liver and kidneys, which may be observed clinically by periodical examination of the urine. Thirdly, the injurious effects of the toxin fall upon the reticulo-endothelial system and they can be followed clinically and by biopsy and autopsy. Enlargement by oedema and hyperplasia of the tonsillar lymphadenoid tissue and of the cervical lymphatic glands appears invariably to follow upon absorption of toxin from the infected mucus covering the tonsils. In neglected cases successive lymphatic glands, spleen and other elements of the reticulo-endothelial system undergo hyperplasia, which results ultimately in leukaemia (the so-called Hodgkin's disease of the dog).

I will mention one or two examples of how infection or intoxication damages a particular tissue through its capillaries. *Invasion* of the kidneys by the B.H.S. produces pyaemic nephritis, which, in survivors, results in scarred kidneys of "chronic interstitial nephritis"; whereas the effect on the kidneys of *intoxication* is the degeneration (nephrosis) of Bright's disease which ultimately leads to "chronic interstitial nephritis." Two differing processes eventually, in the neglected patient, have the same result of contracted kidneys with renal failure and uraemia. Commonly the uterus, and sometimes one or both ovaries, are invaded by the B.H.S. via the blood stream. Invasion of the ovaries results in some degree of dysfunction such as refusal of the male, nymphomania, false pregnancy, and, on rare occasions, in ovarian abscess. The blood-borne infection of the uterus, even of maiden bitches, may progress to chronic cystic endometritis (fibrocystic endometritis) and to the accumulation of a sterile mucus and detritus distending the uterus in the form of the well-known pyometra. On the other hand, infection of the uterus via the vagina at or following parturition is liable to have the more serious consequences of a rapidly developing acute puerperal sepsis with extension of the infection from the uterus to the peritoneal cavity.

One of the most common forms of pyaemic B.H.S. infection is seen in the gingival margin of the alveoli of the teeth, *i.e.*, pyorrhoea alveolaris or parodontal disease. Dissection at autopsy has impressed me with the fact that the deep or concealed damage is more extensive than is revealed clinically. The lesion appears to begin as a marginal gingivitis extending to the alveolar bone and periodontal membrane, resulting ultimately in the loss of the teeth from the affected alveoli.

The disease in whelps may be described under four groups. Owing to the effect of the B.H.S. or toxin *in utero*, foetuses may be aborted or they are born dead or merely survive for a few hours. A second group comprises whelps which contract the infection via the mouth during or soon after birth, develop pharyngitis with oedema of the throat and acute toxaemia and die within three or four days of birth. Thirdly, whelps may contract the infection via the navel, whence it spreads as a serohaemorrhagic or green-tinted exudate through the subcutis and intermuscular fascia of the abdomen and chest into an acute septic peritonitis. A fourth group comprises the milder cases of post-natal infection which survive with chronic ill-health as the weaklings of the pet-dog trade.

The mortality rate in whelps born of infected mothers is high (approximately 30 per cent.); whereas beyond the age of weaning the mortality from the acute infection is less than 5 per cent.; even then it is due largely to the additional influence of intestinal parasitic infection or of such stresses as parturition and surgical operation. On the other hand, among patients which have been denied intelligent treatment, the morbidity is appalling. By these words I do not imply that patients, which are treated according to our notions, are cured in the sense of eradication of the infection. The meaning I intend to convey is that by intelligent treatment morbidity can be stayed or even arrested, though the infection may persist.

With the very wide prevalence of the B.H.S. we have great difficulty in determining whether the almost invariable recurrences are due to retention of the infection or to re-infection. From a large series of follow-up cases extending up to five years I have the notion that retention of the infection is more probable in the majority. I have observed that about 24 hours after dressing the infected mucosae of the tonsils and vagina with sulphonamides I have again isolated the B.H.S. from those treated surfaces. It would seem that mucus is the natural and protected environment of the B.H.S., a retreat in which it can multiply and produce its toxin without invading the underlying tissues. It can so persist for five years certainly; and possibly it may persist to the end of a patient's life. This persistence of the organisms in the mucus seems to be peculiar to the B.H.S. and may be the explanation for its tendency to produce recurrent illness in cycles of about six months' duration. An understanding of the symptomatology and treatment depends upon a clear recognition of this tendency to cyclical relapse.

A cycle is characterized by a pyrexial catarrhal relapse merging insensibly into the lassitude, anaemia and dermatitis of the chronic toxic patient. And as cycle follows cycle degeneration keeps ahead of repair, hyperplasia merges into metaplasia, until natural

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or induced death brings to an end a life which, through human neglect, has barely attained half of its allotted span. The aim of our treatment is to prevent further damage from cyclical relapse. I know of no method of eradicating the B.H.S. infection. Probably you will find that the majority of your B.H.S. cases are the subjects of a persisting illness which has waxed and waned within a cycle of about six months' duration.

Thus, clinically, I would briefly define the B.H.S. infection as a specific contagious infection or intoxication which is characterized by an incubation period of about four days, a protein symptomatology and a tendency to recur in cycles of approximately six months' duration.

Symptomatology

Time is insufficient for discussion of the symptomatology resulting from direct invasion of the tissues by the B.H.S. (*i.e.*, septicaemia, pyaemia, cellulitis). So I propose to offer a few observations on the clinical expressions of the more commonly experienced tonsillitis.

Tonsillitis may be acute or chronic, severe or mild. The acute onset is characterized by sudden malaise and rapid rise in temperature, usually to between 103·5° and 104·5°, sometimes to 106° and occasionally to 107·2°. The patient seeks rest and seclusion and is disinclined to feed, though drink may be taken. The pulse rate is increased. The conjunctival and nasal mucosae are congested. The mouth is dry. The upper surface of the tongue is pale and furred; its edges are reddened. A fleeting erythema over the whole or part of the body surface may be observed, more easily in white-skinned dogs. Sore throat, hoarseness of voice and a short spasmodic cough may be noted. The pharynx is of a diffuse scarlet or it is pale and studded with punctiform spots. The tonsils are scarlet or brick-red and swollen; and at their palpation or the opening of the jaws the patient evinces pain.

Within about 48 hours of the onset the "dry" merges into the "wet" stage, usually with a slight fall in temperature. A watery discharge from the eyes and nose appears and saliva wets the chin. The inside of the external ear glitters as the light falls upon a beady hypersecretion of cerumen. The initial constipation passes into a stool softened by its large content of swallowed pharyngeal mucus; sometimes the stool becomes diarrhoeic; the "muco-enteritis" described by the late Henry Gray.

Until the third day there is no telling what course the acute infection will follow. Thereafter, in a small proportion of cases, the course is either an acute septicaemia or pyaemia or an acute fatal toxaemia. There are two types of the acute fatal toxaemia. In one there is severe constitutional upset with high fever (107°), which about the 48th hour falls to subnormal as the prostrate shallow breathing patient lapses into coma, with urine and melaenic faeces dribbling away incontinently, and dies within about three days of the onset. Autopsy reveals haemolysis, a full smooth spleen and no macroscopic pneumonia though the B.H.S. may be recoverable from the lungs and from its invariable location on the tonsils. In the second type acute tonsillitis and toxaemia are complicated by intestinal parasites (*e.g.*, worms or coccidiosis). Gastro-intestinal signs are more exaggerated and the fall of temperature to subnormal and death is protracted by a day or two and is associated with a terminal septic broncho-pneumonia resulting from the aspiration of vomitus.

With the large majority of acute cases improvement begins about the third day, with or without treatment. Improvement is reflected in the fall of the temperature to normal by about the fifth to seventh day; in some cases the fall of temperature is protracted to about the tenth day. The fall may be step-like, or remittent or saw-edged. Though the constitutional signs abate with the fever there is a lag in the resolution of the local signs in pharynx, tonsils, conjunctivae, nose, superior cervical lymph glands, ears, skin and coat. There may be one or more relapses or the illness may be prolonged; in neglected cases it usually is prolonged, to merge imperceptibly into chronic tonsillitis. During this stage of apparent recovery from acute tonsillitis we should be guarded in prognosis, recalling to ourselves the pathogenesis and pathology of the B.H.S. infection, its liability to relapse and its tendency to recur in cycles of approximately six months' duration.

In the mild type of onset, as the name implies, the constitutional upset is relatively slight and usually escapes the owner's notice unless the patient should vomit mucus. The temperature seldom rises beyond 103·5° and there is little interference with appetite. The patient is lethargic for a day or two, but its behaviour seldom draws attention to its tonsillitis, watery eyes and nose and enlarging superior cervical glands. As a rule it is the appearance of pruritus or skin eruption for which the owner calls in professional advice.

I have mentioned how the local signs lag behind or persist and I should like to follow up this phenomenon (sequelae to the acute initial fever) in the skin and neuro-muscular system.

Skin Changes.—(*a*) Erythema is the initial lesion of the skin appearing within about 24 hours of the onset of fever and fading within a further 24 to 48 hours. In addition to erythema the more severe cases usually show transient scattered pin-head sized scarlet macules which are unaffected by the pressure of a glass slide. A more intense form of the injury to the superficial capillaries is purpura, which usually is expressed as punctiform haemorrhages from the mucosa of the alimentary tract, nose, vagina, urethra or prepuce. It is accompanied by profound systemic upset and followed by brown saliva and acute ulcerative stomatitis. Occasionally the bleeding from mucosae is accompanied by two or three punctiform haemorrhages from the skin. I have had only two cases showing generalized purpura of the skin.

Erythema is followed by the exfoliation of the surface epithelium in large or small semi-opaque brittle scales. According to the intensity of the disease the exfoliation may be profuse or mild, generalized or patchy. It is more readily observed on the edges of the external ears, dorsum, posterior border of the thighs, scrotum, abdomen and axillae. The skin is dry and less pliable; the coat is rough and lacks lustre.

(*b*) Erythema also may be followed by flat oval vesicles of the superficial epidermis on the trunk or at the junction of the mucous membrane and skin of the labia, prepuce, eyelids and lips. A vesicle contains barely a platinum-loopfull of watery fluid; sometimes it contains a greenish viscid matter. The vesicles rapidly rupture. When numerous, closely aggregated vesicles may coalesce and rupture, resulting in a circular or oval plaque of dead epidermis from which the hairs stand erect. A plaque and its hairs can be pealed off in one piece leaving a moist, shining pinkish base which turns to a slaty colour and later is covered by a thin semi-opaque fish-scale scab. Infected whelps over four days of age commonly develop one or two vesicles *beneath* the epidermis at the junction of the hairy and hairless skin of the ventral surface of one foot. They may appear on all four feet. The vesicle rapidly swells into a dome-shaped bleb filled with a blood-tinged watery fluid. Should the whelp survive the vesicular fluid is absorbed or lost by rupture. Following the recurrent pyrexias of neglected mature age a variety of deep vesicle commonly appears on the dorsal surface of an interdigital space. Following subsequent cyclical pyrexias, two and even all four feet may be affected with these interdigital cysts. Almost invariably the appearance of the vesicle is preceded, or accompanied, by intense local irritation causing the patient to lick and gnaw the part. The vesicle rapidly enlarges and contains a watery fluid which may include a grain of necrotic tissue blackened by blood pigment. In my experience fluid withdrawn from the above-mentioned three varieties of vesicle is bacteriologically sterile, provided they are unruptured and have not been licked; also the fluid produces no reaction when injected into or under the skin of puppies. When organisms are grown from the vesicular fluid invariably they are similar to those in cultures of the patient's saliva.

(*c*) More commonly the eruption following upon the erythema begins as papules along the dorsum, in the groin, inside of thighs and abdomen, sometimes on the chest, axillae and posterior border of the thighs and on the muzzle. The papules are rapidly followed by opaque white-domed pustules which on rupture are replaced by a dry yellow crust. Closely aggregated pustules may coalesce and rupture leaving a superficial ulcer which heals more slowly beneath a heaped-up crust. Cultures of the contents of unruptured pustules sometimes produce *staphylococcus*, probably as a result of external contamination. Histologically, these pustules appear to border the orifice of hair follicles and I am inclined to regard them as one of the lesions of the sebaceous gland system. The initial and recurrent pyrexias are correlated with increased excretion of sebum, which is readily observed in the ear. Frequently after a week or two the ears are obstructed by cerumen beneath which putrefaction takes place resulting, if neglected, in a staphylococcal cellulitis of the external ear (suppurative otitis externa). With less facility seborrhoea can be studied in the large sebaceous glands beneath the lower lip, on the muzzle, along the mid-line of the dorsum or in the anal glands. The sebum collects and dries among the hairs as a yellow greasy though friable matter. The skin has a rancid odour. With the progress of the disease in a neglected chronic toxic patient the sebaceous glands become less responsive to stimulation and the reduction or absence of sebum contributes to the dry thickened condition of the skin with its lack-lustre coat of denatured hair. Literally the sebaceous gland system of neglected patients reflects the waxing and waning of the B.H.S. toxaemia.

(*d*) I have mentioned the response to the two types of focal injury (vesicular and pustular eruptions) as scab-formation, secondary

infection, etc. In addition, the neglected case presents a chronic exfoliative dermatitis in the form of a dry, thick, rough, darkened skin which, at pyrexial recurrences, may show cracks and fissures exuding a glutinous matter. The moulting of the coat is delayed and irregular, the hairs are brittle, easily broken and more vertical. Not infrequently the pyrexial recurrence is followed by alopecia over the flanks and ventral aspect of the body and head; some patients become almost bald within a week or two. Eventually the last stage of chronic exfoliative dermatitis is reached with a dry, darkened, thickened, wrinkled, corrugated, scaly skin, which most appropriately has been termed "elephant skin." With exfoliation pruritus is invariable, sometimes intense and leads to many complications and distortions of the dermatological picture. Pruritus is intensified by exposure to heat and it is exhibited by rubbing the dorsum against fixtures, rubbing the muzzle along the carpet, or by scratching, licking or gnawing. Constant rubbing or scratching leads to breaking of the hairs, excoriations, secondary infection, and thus to "eczema," ulceration, abscess and cellulitis.

Other sequelae to tonsillitis are (1) renal degeneration (nephrosis or Bright's disease), leading, if untreated, to renal failure with uraemia; (2) hyperplasia of the reticulo-endothelial system (leukaemia); (3) injuries to the female genitalia; and (4) nervous. In the limited time at my disposal I shall confine my remarks to a few observations on nervous sequelae.

My series of 400 cases include two of meningitis (confirmed by autopsy). I have not identified encephelo-myelitis. Thus it would seem that injury of the central nervous system as a consequence of its invasion by the B.H.S. is infrequent.

Secondly, there is a group of chronic cases which showed spasms which varied in type, frequency, duration and location. The group might be labelled spasmophilia. I have records of three patients with clonic spasms of the masseter muscles resulting in "chattering of the teeth." The spasms came on at irregular periods and, though rhythmical, the rate of the rhythm seemed to vary during any one attack; they would cease while the patient's attention was focused temporarily, *e.g.*, on a cat. Illustrative of a toxic spasm is a bitch which is still living. For the past three years, following an acute B.H.S. infection, she has held her head rotated through an angle of about 15°. This posture, though almost habitual, is temporarily adjusted to the normal for short periods when her attention is occupied as in rabbiting or romping with her owner. Clinically, I have been unable to determine the cause of these clonic or tonic spasms or to localize them to a part of the central nervous system. They are not associated with increased sensitiveness or with wastage of the affected muscles; and they do not respond to calcium, salicylates, massage or narcotics. Their mechanism has yet to be determined.

Thirdly, varying degrees of hyperaesthesia are very common in the chronic patient; sometimes it is the owner's reason for calling in professional advice. An outstanding example of hyperaesthesia is pruritus, the scratching, rubbing and gnawing of the skin resulting in excoriations. Usually pruritus has a regional distribution such as the dorsum of the back, loin and tail, the anterior surface of the metacarpals, the ears and muzzle; at any one time several regions may be sensitive simultaneously. I would emphasize that the distribution of the pruritus is not necessarily correlated with that of the initial B.H.S. dermatitis. With anal hyperaesthesia the patient, preceding the act of defaecation, whines or whimpers, crouches with full flexion of the loin and hind limbs and by movement of the extended fore-limbs drags or rotates its rump, only to quieten as the stool emerges. Such patients are apt angrily to resist the insertion of the thermometer and to constrict the anus; though once the bulb of the thermometer has penetrated the anal sphincter the spasm and the patient's resistance pass away. I am well aware that this behaviour is exhibited by patients with inflamed anal glands, which I have previously referred to as a sequel of the seborrhoea of the B.H.S. infection. But I have also observed this anal hyperaesthesia in patients which have shown no abnormality of the anal glands at subsequent *post-mortem* examination; and I am under the impression that inflamed anal glands sometimes resolve and do not necessarily become secondarily infected with staphylococcus and suppurate. There is another somewhat similar local hyperaesthesia in bitches. On eversion of the labia for the introduction of a vaginal swab some chronic patients, even multipara, show vaginal spasm and excitement. On soothing the patient and waiting for a minute or two with the swab in the vulva, the spasm passes off and the swab can be introduced up to the cervix without further hindrance.

Fourthly, there is the behaviour which is commonly termed rheumatism. In chronic B.H.S. patients rheumatism is shown as a stiffness of the loins and quarters at the beginning of progression; the stiffness passes off with exercise. Deep palpation over the lumbar roots evokes pain of varying degree which is traceable along the course of the sciatic nerve and is particularly sharp on pressure in the popliteal space. Some patients not only cry out when the loin is held but have learned to cry in apprehension of being touched.

The one part of the morbid anatomy of the B.H.S. infection which I have not succeeded in correlating with the clinical history is the nervous sequelae. There is much work to be done on it. Until the pathology has been made more clear to us I prefer to record my observations in terms of behaviour. May I make a plea for our avoiding such words as "chorea" and "brain trouble," which are descriptive of nothing in particular. Finally, I would suggest as a rough guide to the clinician that when he observes signs of infection plus signs of encephalo-myelitis, he should regard the virus of canine distemper as the causal organism until clear proof to the contrary is obtained.

Treatment

General Treatment.—The general treatment of infectious disease is familiar; I will mention only a few points. The B.H.S. infection is highly contagious, consequently the patient should be isolated. Though dog to man infection has not been proved, the Lancefield groups G and C are common to both species and I think we should discreetly advise that the infected dog be removed from contact with little children and pregnant women. Exposure to chill should be avoided, the "weak spot" in the dog being its kidneys. I have several cases of the onset of fatal uraemia following within 24 hours of the convalescent patient swimming in the Serpentine on a bitterly cold day. I have not been impressed by the hygiene of the large majority of dog breeding, boarding, greyhound and foxhound establishments which I have visited. When every allowance is made for shortage of labour or money it seems to me that the professional dog world's ignorance of the elementary principles of sanitation imposes much arduous work and teaching upon our profession. On the whole, the standards are much better among pet-dog owners and this enables us to anticipate a more favourable prognosis when treatment of the B.H.S. infection can be carried out in the home of the private owner.

Specific Treatment.—We designed our method of treatment ten years ago as the means of conferring sufficient antibacterial and antitoxic resistance to enable the dog to withstand an initial attack, or, in the case of infected dogs, to prevent further damage. At first our method was applied in breeding kennels to enable infected bitches to breed and rear their whelps; later we applied the method to the curative and preventive treatment of all cases of the B.H.S. infection. All dogs on the premises are inoculated with a course of autogenous vaccine (formalinized 36-hour broth culture) and the course is repeated at six-monthly intervals. In badly infected kennels the course may be repeated at three-monthly intervals during the first 12 months and thereafter at six-monthly intervals. A polyvalent stock vaccine is a slightly cheaper alternative. The second component of our method for breeding establishments is a quarterly clinical examination by the veterinary surgeon in the case of each dog in the kennels, coupled with such laboratory service as he may require. For the better conduct of the work we urge that owners should keep detailed records of each dog.

On the average some 12 to 18 months of routine work is required in a breeding kennels to convert loss into gain, to bring down the whelp mortality rate from 30 to 5 per cent., to ensure breeding and stop sterility and abortion, to prevent puerperal sepsis and to secure uneventful parturitions. In assessing the benefit of repeated vaccination due allowance must be made for the culling of chronic cases, whose damaged organs are beyond repair, and for the introduction into the stud of younger stock already endowed with some measure of protection. Secondly, I find great difficulty in assessing the degree of damage to an infected bitch's fertility at the time of her first vaccination; it may take some 12 months of patient observation before deciding whether or not she should be mated again. Thirdly, neither vaccine nor natural infection confers a durable immunity; at the best vaccine confers a resistance of no more than about six months' duration; even then the resistance is more antibacterial than antitoxic. Fourthly, though vaccine affords resistance enough to prevent further damage at a pyrexial relapse, it will not destroy the B.H.S. resident within the mucus clothing surfaces such as tonsils, vagina and prepuce. Neither will anything else which we have tried; and so we return yet again to the difficulty of destroying the B.H.S. in its natural environment. Our use of streptococcal antiserum as the sole therapeutic agent has been confined to a relatively small number of new-born whelps and cases of puerperal sepsis; it appeared to exert no beneficial effect.

Systemic Treatment.—For the acute case with a temperature of 104·5° or above we also advise sulphonamides in maximum dosage. Once the temperature has fallen below 104·5° the administration of sulphonamides should be stopped; their continued use gravely

upsets the digestion and absorption of food. Where operative measures involving deep incisions must be undertaken, before the results of laboratory tests are known, a dose of stock B.H.S. vaccine should be given before operation and the course should be completed at the appropriate intervals after operation. We have no experience of penicillin. For alleviating the degeneration of kidneys and liver we advise liberal quantities of glucose and barley water. For the dyspepsia and vomiting due to swallowing pharyngeal mucus we advise mist. pot. cit. and sodae bic. t.i.d., and for constipation pil. hydrarg. For the treatment of the skin lesions the hair on and around the lesions, or the entire coat, should be clipped. The patient is then given a daily hot soapy-water bath followed by some 15 minutes' massage of the entire body surface, using a little rape oil as lubricant. Additional dressings are rarely required, nor are they tolerated by most patients, whose licking is usually more beneficial than drugs. Mr. Harvey Clarke has drawn my attention to his finding benzyl benzoate very useful for the advanced stage of chronic exfoliative dermatitis and I hope he will report on it in more detail to-day. The ears, nose and eyes require dressing with tampons of warm normal saline while the patient is in its bath. For pyorrhoea, after scaling the tartar, the teeth should be brushed with H_2O_2 and warm water. For purpura we advise adrenalin locally and calcium lactate grs.v, t.i.d. For rheumatism, massage following the hot bath is beneficial; to fatigued chronic patients we also give aspirin.

Without burdening you with statistics, I can point to the fact that for ten years our method of treatment has stood up pretty well to the stern realities of general practice.

Differentiation From Canine Distemper

There seems to be a strange reluctance on the part of certain teachers in the veterinary schools to equip their students with the means of differentiating the B.H.S. infection from canine distemper. I would like to offer a few observations on the problem.

(1) Laidlaw and Dunkin found that recovery from one attack of natural infection by the virus of canine distemper resulted in a solid immunity for life. Furthermore, they found that dogs vaccinated with their formalinized virus and living virus method proved to be solidly immune, and that the immunity is long lasting. These conclusions have stood the test of universal experience and so far remain unchallenged. The large majority of our 400 adult B.H.S. cases and dams of our whelp cases had been vaccinated in puppyhood by the Laidlaw-Dunkin method; consequently I have felt secure in regarding them as durably immune to the virus.

(2) Laidlaw and Dunkin defined canine distemper in the following words: "an acute infectious fever characterized by an incubation period of four days, a coryza at the onset of the disease, an unusual temperature curve, severe gastro-intestinal disturbance, and a variable set of symptoms due to inflammation in the respiratory tract. In a proportion of cases nerve symptoms, due to an encephalitis, may develop." I have offered a definition and a rapid impressionist sketch of the characteristics of the B.H.S. infection. It seems to me that the distinctive pattern of the illness produced by the virus alone differs from, far more than it resembles, that of the illness produced by the B.H.S. alone. Moreover, this distinctive pattern of the B.H.S. infection in dogs is simulated by that of the B.H.S. infection in man, horse, swine, cat and cattle. I am unaware of any evidence that these animals and man are naturally infected by the virus of canine distemper.

(3) It seems to me that in canine distemper and the B.H.S. infection we have two separate specific entities which can exist alone or in combination. What should I do when called to the sudden onset of acute pyrexia and pharyngitis in a young dog which has not been immunized against distemper? One cannot wait several days for the unfolding of the symptomatology and the report of laboratory tests. I should "back both hosses both ways," by giving Burroughs Wellcome distemper virus antiserum, sulphonamides, the first dose of stock B.H.S. vaccine and the usual commonsense general and symptomatic therapy. If the client could afford it I should send material to a veterinary laboratory for diagnosis; *e.g.*, tonsil swab, nasal discharge for ferret inoculation, faeces and a history of the case.

It is our duty to persuade the dog world to have all puppies vaccinated against distemper. I hope Burroughs Wellcome will be able to produce adequate supplies of their virus vaccine, which, thanks to the painstaking work of Professor Tom Dalling, has been developed into one of the most reliable biological products on the market. It has brought to fruition the outstanding achievement of the late Sir Patrick Laidlaw and George Dunkin. From all this British work on canine distemper we should draw inspiration and hope for our task of understanding and conquering the B.H.S. infection, which to-day is the major problem of dog practice.

Summary

The author has briefly surveyed some of the clinical findings in his records of 400 cases of *beta haemolytic streptococcus* infection of dogs extending over the past ten years. The differential diagnosis of canine distemper has been mentioned.

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Discussion

Opening the discussion, Mr. T. L. Wright asked whether it was correct that the administration of sulphanilamide should cease when the temperature dropped below 104·5°.

Mr. R. E. Ticehurst noted that, with reference to the inoculation against distemper, Dr. Hare had mentioned only the vaccine-virus method. He (Mr. Ticehurst) had used the virus-serum method with good results and he wondered if Dr. Hare considered the vaccine-virus method to be the better of the two. He was surprised to hear from Dr. Hare that the B.H.S. infection was a cause of hysteria. He would like to know to what extent Dr. Hare considered a deficiency of the vitamin B group was responsible.

Mr. M. H. Clarke: *Beta haemolytic streptococcus* infection was extremely important. He congratulated Dr. Hare on giving so complete a picture of an acute febrile disease passing into a chronic infection. It was this chronic stage which was seen mostly in his experience, and in discussion with neighbouring practitioners he found that they, too, had the same experience. He found that this disease occurred mostly in over-stocked breeding kennels, where conditions of hygiene and feeding were not good, the predominant symptoms being sterility and abortion, often complicated by skin lesions. During the last few years he had treated these cases of chronic dermatitis with benzyl benzoate emulsion. In some breeds response was rapid, but not so in others; short-haired breeds responded more rapidly than long-haired. He advised the daily application of the emulsion for one week, and then a further application for one week, with a week's interval between. He had tried daily baths and massage for these cases, but the difficulty arose in getting the owners' full co-operation in this task.

Miss M. Jordan mentioned that one of the sources of the spread of the infection apart from indiscriminate breeding and over-crowding in many kennels, was the pet shop. She suggested some sort of official inspection of these places, and that every attempt should be made to control the disease, which was far more of a problem to practitioners than distemper.

Mr. F. P. Barrett: He was most interested in the question of whether this disease occurred in an acute form. It appeared that many of those present that day had an open mind on this point. He referred to an outbreak of illness at a breeding and boarding kennels, amongst several dogs, some of them previously immunized against distemper by the virus-serum method, and others not so protected. All these dogs suffered from a condition indistinguishable from distemper. Some developed epileptiform fits in the terminal stages, while one previously immunized animal became affected with chronic chorea of the masseter muscles. On the balance of the evidence he thought this outbreak of disease was not distemper, but his confidence was slightly shaken by the appearance of these nervous complications. He would like Dr. Hare to indicate how an acute attack of illness caused by B.H.S. could be distinguished from distemper in the initial stages. He had been informed that in the Sutton Coldfield area there had occurred a considerable number of sporadic cases of illness in dogs, some of which were immunized and some not, which was indistinguishable from distemper, and yet gave no response to adequate doses of distemper serum exhibited at a sufficiently early stage. These were thought to be cases of B.H.S. infection.

Dr. Hare had suggested that although the infection might be found in the vagina of the bitch and in the prepuce of the dog, it could not be transmitted as a venereal disease. He (Mr. Barrett) would like to know what was the evidence for this statement.

About the use of sulphonamides, Dr. Hare had said they should be discontinued when the temperature fell below 104·5°, but his experience was that one should continue the treatment until the temperature fell to normal, or in any case not longer than four days.

Dr. Hare had referred to a case of B.H.S. infection in a dog, still surviving, which developed chorea of the face muscles, but in which there was no involvement of the central nervous system. He would like to ask Dr. Hare how he arrived at this conclusion about an animal which was still alive.

Miss M. Freak: She was glad they had that opportunity of discussing a subject so vitally important to the canine practitioner, the more important from the amount of publicity that it had of late received in the lay kennel press. Not all of this publicity had been accurate or well advised, and the profession, within which there were still considerable differences of opinion on the matter, needed to be better equipped to advise the dog breeder. There were several points on which she would appreciate further information from Dr. Hare.

He had given them a formidable list of symptoms which might be caused by the *Beta haemolytic streptococcus*, or Group G streptococcus, but he had not said upon what evidence he based his assumption that this organism is, in fact, responsible for them all.

The question of the so-called healthy carrier was one which required elucidation. We were aware that Group G streptococci could be isolated from the tonsils, vagina or prepuce of dogs apparently in normal health at the time. Bacteria could presumably exist in these sites in three capacities, firstly as actual pathogens (*a*) in active disease, or (*b*) remaining in recovered cases; secondly, as potential pathogens liable to cause disease only if activated by some secondary factor or factors of environment, and thirdly as symbiotes of no pathogenic importance.

The pathogenicity of the Group G streptococcus was not questioned in cases of acute febrile disease but more evidence seemed to be needed as to its role in cases showing chronic lesions and in the apparently healthy.

Her second query concerned the existence of complicating factors. A good deal had been said that afternoon of the differential diagnosis between B.H.S. infection and canine distemper but very little of its co-existence with distemper, staphylococci, bronchisepticus or other mixed infections.

In her experience the majority of canine distemper cases were complicated by secondaries, of which B.H.S. might be one; presumably also B.H.S., if the primary infection, might be complicated by, for example, staphylococci or bronchisepticus without the presence of distemper virus.

The question of the pathogenicity of staphylococci either with B.H.S. or alone, when found on tonsil, vaginal or prepucial swabs was another point on which she sought enlightenment. She had found in a high percentage of swabs taken from suspected strep. cases of all types (mostly recurrent tonsillitis or respiratory cases but some skins, etc.), that the pathologist had reported the finding of haemolytic staphylococci.

She should like to quote a recent case to illustrate the difficulty of immediate clinical differentiation and also to bring out this query on the part, if any, played by the staphylococcus.

The subject was a spaniel bitch of three months which had been in the possession of the owner for three weeks. During that time it had fed moderately well and been fairly lively but, in the owner's words, had been dull about the eyes. She

was called in because of the development of acute skin lesions, starting as pustules, breaking, coalescing, and leaving, as Dr. Hare had described that afternoon, intensely irritating areas covered by flat shiny scabs. Temperature varied from 102·5° F. to 103·5° F. Tonsils and pharynx were slightly inflamed. The relative possibilities of Group G streptococcal infection and/or canine distemper with secondary skin lesions, of which the causal organism was as yet unknown, were discussed at that time.

As the somewhat vague history of illness extended over three weeks the use of distemper serum was not considered. The skin showed no response to sulphonamide ointment (Bayers Uleron) or to gentian violet.

A swab from the tonsil (a suitable fresh skin lesion was not found at first) brought a report of haemolytic staphylococci without any obvious indication of the role they were playing. A second swab from an unopened skin lesion showed a pure culture of haemolytic staphylococci, apparently the cause of this lesion, but why were they also present on an inflamed tonsil, and were they connected with that inflammation?

The logical treatment with staphylococcus toxoid could not be attempted as the case subsequently proved to be a distemper and having developed severe chorea of the lower jaw, was destroyed.

Concerning treatment of Group G streptococcal infections in the early acute case, sulphonamides are clearly of value.

Because of the possibility of staphylococcal infection as a complicating factor, she tried using sulphathiazole in the majority of her cases in preference to sulphapyridine. Results were inconclusive and generally disappointing, she thought largely due to the fact that this drug appeared to be much less well tolerated by the dog than was sulphapyridine, always causing greater depression and frequently causing vomiting.

She differed from some speakers that afternoon in that she had found a serum prepared against Group G streptococcus of definite value in the early acute case. She would advise its use in conjunction with a member of the sulphonamide group before results of swabs were obtained. It had not, she thought, any value in the chronic case.

In chronic cases her results with autogenous vaccines had varied from spectacular success to complete failure. She would quote briefly one case of failure, not because she wished to emphasize the failures but in order to put a further question to Dr. Hare on their causes.

The subject was a Scottie bitch of five years with a two years' history of intense pruritus, complete lack of undercoat, bare patches due to rubbing, and vesicular lesions after becoming secondarily infected due to self-inflicted injury.

It was her practice in chronic skin cases to take scrapings and test urine before she considered swabbing, and negative results were obtained in this case.

A tonsil swab revealed Group G streptococci and autogenous vaccine was given in conjunction with general treatment of the skin itself.

The dog's condition subsequently was worse than it was before injections were commenced.

Was she to assume that failure was due (*a*) to the fact that the streptococci on the tonsils had nothing to do with the lesions on the skin: or (*b*) that possibly autogenous vaccine failed to control lesions that were an end result rather than an active phase of an infection?

She should like to ask Dr. Hare, further, what comment he had to make on reports that skin lesions not previously present had flared up after the use of vaccine and also that bitches, proven breeders, had become sterile after its use.

Having ended her list of queries, she would like to add her plea for more research into the subject, more readily available laboratory facilities, and greater co-operation between the pathologist and the clinician. It was obviously desirable that swabbing should become a routine check on diagnosis, not merely a luxury for those who could afford it or who wanted vaccine. Nor should they have to feel that they were imposing on an already overworked pathologist, more vitally interested in some other work, by asking him or her to examine swabs.

On their part, as clinicians, they might assist the pathologist by more and better case histories, not only at the time the swabs were taken but following up with the end results later.

Dr. W. R. Wooldridge asked whether Dr. Hare had been able to satisfy himself that the various pathological and disease condtions he had described could be induced by experimental inoculation or infection with B.H.S.: in other words, had he been able to satisfy Koch's postulates? It seemed to him that such experiments were necessary before one could be dogmatic about the pathogenicity of these streptococci. Merely to isolate an organism from an animal did not imply its pathogenicity as the work of Topley, Straker, Lovell and others had shown in their careful work upon the flora of the throat of several groups of human beings. These experiments showed that both non-pathogenic and pathogenic organisms might be found commonly present in normal throats. Their work was carried out upon large groups of individuals and over a period of years, and indicated that even pathogenic organisms, such as the diphtheria bacillus or meningococci, could be carried without giving rise to any untoward symptoms. These and other factors must be remembered in assessing a laboratory diagnosis based merely upon the examination of swabs sent in by clinicians, particularly when the diagnosis arose largely from the isolation of an organism which had not been shown to be the cause of disease by rigid experimentation.

Miss Hearder asked whether the owners of infected animals could carry the B.H.S. infection on their clothes and hands to other people's dogs? If people could be persuaded to clean out and disinfect their establishments, how long would it be before it was safe for them to start breeding again? They were also having great difficulties with regard to pet shops and dog dealers spreading infection by selling ill pups. Was it not time something was done to curtail their activities for the sake of the general public—could not veterinary inspection of some sort be made compulsory?

Mr. G. A. Tomlin pointed out there was a letter in *The Veterinary Record* intimating that the R.S.P.C.A. wished to get a private members' Bill to regulate pet shops. At present nothing could be done. They were a menace and open-air markets were even more objectionable.

Mr. F. Francis asked if sulphanilamide was of any use in this condition. He understood that it had no action in the presence of pus.

Mr. G. E. Joss disagreed with the last few speakers, in that the good results attributed to sulphanilamide in cod-liver oil were most likely due to the oil rather than the sulphanilamide, as he understood that the action of sulphanilamide in the presence of cod-liver oil was retarded and somewhat diminished. He had attended kennels where B.H.S. had been diagnosed, and the "typical" syndrome of sterile bitches and dead puppies, etc., existed. He did not give vaccine treatment or sulphanilamide therapy, but relied upon correcting the diet and general management of the kennels. After a short time the condition disappeared automatically. He found that these "B.H.S. conditions," *i.e.*, breeding troubles, etc., did not exist where the food was correct in quantity, quality and type. There seemed to be discrepancies in the results of identical swabs sent to different laboratories. Could Dr. Hare suggest a reason for this, or did he have a special method for culturing the B.H.S.? He agreed with Miss Freak in that many "typical B.H.S." cases came back as staphylococcal infection.

Miss Hernaman-Johnson: She had used sulphanilamide powder in cod-liver oil with great success in suppurating ears and also on infected wounds for a number of years. The presence of pus did not seem to destroy the effectiveness of the remedy.

Dr. R. F. Montgomerie: It would be most interesting if one could have further discussion on the mechanism by which this haemolytic streptococcus was reputed to set up the disease syndromes which Dr. Hare had mentioned. It appeared to be suggested that this organism caused the various effects ascribed to it—acute as well as chronic—by some toxic process. The word toxaemia had been used in describing both symptoms and *post-mortem* appearances. He had found it difficult to accept that this streptococcus did produce a toxin and would be interested to hear the evidence on this point. If, as had been suggested, the syndromes which had been described were, in fact, those of toxaemias resulting from the infection with a *Beta haemolytic streptococcus*, then one must ask how far these syndromes could be reproduced either by the inoculation of culture filtrates or extracts of the organism. Could the acute phases be reproduced by one or more fairly large doses of culture filtrate or extract? Could the more chronic effects be reproduced by repeated small injections over a long period? It had been said that it was not possible to produce a satisfactory antiserum. This appeared somewhat surprising if the pathological conditions were the result of the absorption of a toxin.

Mr. Clarke (speaking again) said that one speaker had brought up an interesting point by showing that acute B.H.S. infection when treated with sulphonamide and benzyl benzoate resulted in rapid alleviation of the syndrome. He felt that it was just this type of case which gave so much trouble at a later date, perhaps nine months to a year.

Mr. Holliday-Pott: He practised in the same district as Mr. Clarke and confirmed that the cases of B.H.S. he most frequently met with were of the chronic tonsillitis and chronic exfoliative dermatitis types.

He had used a great deal of vaccine, both autogenous and heterogeneous, on a large number of cases with usually very good results. He felt, however, that there was too high a percentage of cases that did not show an improvement to his satisfaction, and he was now using sulphonamides as an adjunct to vaccine with encouraging results. He would be interested to hear Dr. Hare's views and of any other additions to treatment that he could suggest.

He would like to know why Dr. Hare thought that sulphonamides would not be useful when the temperature was below 104·5° F. because he had had good results in chronic cases where the temperature had never been as high.

Although Dr. Hare had said that he had had no experience of penicillin treatment, could he tell the meeting if the organism was penicillin sensitive?

He would also like to know what the risk of humans contracting the disease really was. He was constantly being asked this question and except for a suggestion that pregnant females and children under four years could contract it, he was unable to give a satisfactory reply. Although there had been a few suspicious cases amongst his clients, none of them (to his knowledge) was proved to have it and a number of doctors he had spoken to had seen no case.

The nervous syndrome in this disease he had heard described as spasmophilia and not chorea. In his cases he had noticed more spasmodic involuntary movements than a tendency to convulsive seizures. Would Dr. Hare give him the actual cause of the nervous condition?

Miss O. Uvarov supported an earlier speaker in connection with the examination of patients in clinics—where large numbers were seen in a short space of time: clinically, there were many potential carriers of this infection, and it was difficult to explain the intricacies of B.H.S. and its problems.

In private practice the aim was isolation of B.H.S., and cost had to be mentioned, not only of isolation, vaccination at the time, if positive, but also re-vaccination at six months' interval, as recommended by Dr. Hare. One could not help feeling that degenerate conditions in older dogs might be due to a form of toxaemia in early life.

The majority of clients asked for vaccination, but many breeders were very perturbed about the whole aspect of it, and one had to be sure of one's facts to convince them. In these cases it was essential that veterinary surgeons should have a definite ruling on B.H.S. infection. She found that vaccination was essential and effective in the following groups of cases:—

(1) Breeding bitches, particularly in kennels: Was it B.H.S. infection that was causing a condition of re-absorption of foetus in some bitches? These patients were perfectly normal up to full time, yet foetuses disappeared either in a matter of some hours (overnight at times) or a few days before or after the day of whelping.

(2) Skin lesions: The most spectacular were the cellulitis cases—which in olden days, clinically, were diagnosed as ringworm. Several cases had been encountered where all external and internal treatments failed, and lesions only cleared up on vaccination.

There was one "snag" to vaccination of skin lesions: at times one got a most alarming reaction, and patients broke out in an extensive eczema-like lesion. Was this ordinary vaccine reaction, or a different stage of infection so far unaccounted for?

(3) Miscellaneous groups, including the dyspeptic types, chronic tonsillitis, chronic conjunctivitis, etc.: These responded very well to vaccination, particularly was general improvement most spectacular in short-coated dogs.

Clients looked for clinical cures, so could one eliminate the infection after the prescribed three vaccinations, and could one look forward to using penicillin as a cure?

What was the relationship between human and animal streptococcal infection and was it group A or E that was encountered mostly in the human?

The Reply.

Dr. Hare, in reply, said that he agreed with the contention that his work on the B.H.S. infection would remain provisional and incomplete until it had been reproduced experimentally. Nevertheless, the profession to-day was in possession of knowledge which was not available in 1924, when he began to study the pathology and symptomatology of streptococcal infection. Ten years passed before he had recognized that the B.H.S. was something apart from other streptococci and had worked out his notions of the naturally occurring B.H.S. infection. Then, with Dr. R. M. Fry's invaluable help in grouping the strains, he was able to put his provisional definitions and treatment to the exacting test of general practice in 1935. It would seem that during the past ten years his notions were proving helpful to an increasing number of veterinary surgeons at home and overseas.

He had worked in the belief that the first objective for an attack on the problem was a definition of the naturally occurring B.H.S. infection which would receive the general approval of veterinary surgeons in practice. Once this first objective had been reached and consolidated the experimentalist would be furnished with the criteria by which he could measure his experiments and advance to the next objective of reproducing the natural infection. Was he right or wrong in thinking that the clinical method of enquiry by inference from carefully measured observation of naturally occurring phenomena is the essential precedent to enquiry by the experimental method?

While pursuing the clinical method he had not neglected the experimental; but his work had been entirely dependent upon his private resources and the goodwill of certain colleagues in private practice. Under such restrictions the experimental method could have its moments of exasperation and defeat; but even failure was tinctured with a measure of enlightenment; and this he would briefly summarize. (1) From the introduction of cultures of canine strains of the B.H.S. into mice, guinea-pigs and rabbits something might be learned of the organism's

pathogenic effects on such animals; but the natural infection as observed clinically in dogs was not thereby reproduced. (2) For such an object healthy dogs, which had not been naturally infected by the B.H.S., were necessary. Moreover, they and the controls must be maintained free from the natural infection. Experience had induced him to conclude that these difficulties were likely to be overcome only by breeding, rearing and maintaining a colony of dogs under the strict quarantine technique comparable to that which was devised and so successfully exploited by the late Sir Patrick Laidlaw and George Dunkin in the case of canine distemper. He was hopeful that the medical and veterinary professions would unite in urging upon private and public benefaction the need for large resources for the setting up of research into the B.H.S. infection of man and animals by a team of medical and veterinary experimentalists. The haemolytic streptococcus infection was one of the world's major crippling diseases of man and animals.

He could not accept Miss Freak's assertion that the B.H.S. is recoverable from *healthy* dogs. She would recall the emphasis he had placed upon the cyclical waxing and waning of the chronic infection. The mild signs of the waning phase were there though they might be overlooked by the inexperienced. The risks of error were considerably reduced by thoroughness in noting the case history, a technique which was both the foundation and hall-mark of success in the clinical method. The clinical expressions of the chronic B.H.S. infection were unlikely to conform to the speed at which certain small animal clinics have been alleged to work. The nature of the patient and the nature of its disease were the pacemakers of the clinical method. Might he suggest that Miss Freak should invite her pathologist to express the results of his swab examinations in clinical terms instead of bacteriological jargon.

He could offer little in reply to Miss Hearder's important question, which required precise knowledge of the organism's survival apart from its host; *e.g.*, for how long and under what conditions could the B.H.S. survive in the bedding and dust of infected premises or upon the hands and clothing of attendants? From fresh preparations of the infected tissues of the living or newly dead animal the B.H.S. was recoverable on culture media with relative ease compared with preparations which had been over three days in transit to the laboratory. So many factors contributed to the result of cultured or biological tests of such preparations; *e.g.*, the initial density of the organisms, their group, the rapidity of growth of saphrophytic contaminants, etc. Probably putrefaction and drying were antagonistic to the survival of the B.H.S. in swabs and *post-mortem* material. On the other hand, in fresh vaginal exudate which had been dried and preserved at room temperature in the laboratory the B.H.S. was capable of surviving up to ten days. Pending the accurate measurements by bacteriologists in kennels, he would assume 14 days to be about the maximum period of survival of the B.H.S. in the litter of an infected kennel; *i.e.*, a kennel, two weeks after its thorough disinfection, should be safe for the reception of a healthy dog. He hoped some veterinary bacteriologist would investigate this problem; it had very important applications to the management of showrooms and their equipment, transport, etc.

The answer to the question as to when breeding could recommence was not dependent upon the survival of the organism outside its host or upon the quality of the disinfection of the premises. The fitness of each bitch for mating must be assessed on her age, history, treatment and clinical condition. When called upon to re-examine a bitch with a view to determining her fitness for mating, he required, as a minimum, that she shall have remained clinically normal throughout six months and have had a normal oestrus. Having seen so much suffering inflicted upon infected bitches through man's ignorance or cupidity, he, when doubtful of the prognosis, preferred to wait and see what happened by disallowing mating for a further six months.

He regarded the specific bacteriostatic action of sulphonamides as having been effected when in the acute case the temperature fell below 104·5°. Further administration of the drug seemed to have no direct effect upon the B.H.S. localized to the tissues and might prove harmful to the patient. But he saw no disadvantage in using sulphonamides prophylactically for a limited purpose; *e.g.*, for a bitch while attending a show or visiting a kennels for mating, or for an infected patient undergoing surgical operation. The important thing was that the administration of sulphonamides should be under the direction of the veterinary surgeon for a specific object which he could understand and control.

Until he had a clearer notion of the pathology of the clinical varieties of spasms which were exhibited by some B.H.S. patients, he would prefer the inclusive word spasmophilia, which means a tendency to abnormal movements and comprises tremors, tonic and clonic spasms, tetany, convulsion, epileptiform convulsion and choreiform movement. In his paper he had given a few illustrations of the difficulty in determining by clinical methods the seat of the lesions. It was to be hoped that with increasing knowledge the existing clinical classification of spasmophilia would be replaced by an aetiological classification.

Two speakers asked if hysteria was due to the B.H.S. or to vitamin B deficiency. He was not aware that either of these alone caused hysteria. In his experience canine hysteria was usually due to the combined action of the B.H.S. infection and intestinal parasites. He had no knowledge of vitamin B deficiency as a naturally occurring disease of dogs. He understood that dogs synthesized adequate amounts of vitamin B. It seemed possible that some of his colleagues were accepting the signs of experimentally produced vitamin B deficiency in dogs as those of a naturally occurring disease.

As this was a clinical meeting he hoped to be excused from citing the standard literature of bacteriology in answer to Dr. Montgomerie's interesting questions.

INTUBATION OF THE ABOMASUM OF SHEEP

In its issue of February, 1945, the *Australian Veterinary Journal* describes a method for passing the stomach tube directly into the abomasum of sheep. By using a light rubber tube, and by syphoning water into the mouth when the tip of the tube was just oral to the cardiac orifice, the tip of the tube was carried along as the animal swallowed. By filling the tube with barium sulphate solution, its progress could be followed fluoroscopically. The method can be used in a very limited way, because it can be applied to only a small proportion of sheep.

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Weekly Wisdom

The establishment of a new committee or institute is not in itself a contribution to technical advance.—The Times.

CLINICAL COMMUNICATION

Clinical Report on a Glandular Disease Occurring in Epidemic Form Amongst Dogs

By
HARRY HOLROYD, M.R.C.V.S.,
AND
ALEX. H. HOGG, M.R.C.V.S.

General Introduction

This short article, written from the clinical standpoint, has been published in order that other members engaged in canine practice may have the opportunity of noting whether any syndrome of a similar character has occurred recently in their respective practices, and whether they can add anything further regarding its aetiology, manifestations and treatment. The disease—which has been referred to in this practice, for want of any other known name, as "glandular fever"—has occurred in epidemic form only.

There have been two epidemics. The first, of short duration, occurred during the summer of 1944, and the total number of cases seen was no more than ten, but they were all seen within approximately two to three weeks. A similar epidemic has occurred this summer (1945) of longer duration and involving between 40 and 50 dogs. The first case this summer occurred on June 23rd, and the last fresh case on October 9th. Neither of us had seen the disease before. During 1944 we had only just realized that we were dealing with an infectious syndrome when fresh cases ceased as quickly as they had commenced. We have been prepared since then for a similar outbreak and accordingly when the first case occurred this summer we kept close check on similar cases which quickly followed. For the purpose of this article we have confined our remarks more especially to this year's (1945) outbreak. The disease has occurred in the acute and sub-acute forms in the majority of cases, but a few of the dogs towards the end of this year's outbreak relapsed into a chronic form.

Symptoms (Acute Form)

The disease has attacked dogs of various breeds and ages. In a series of 20 recorded cases occurring during this summer's outbreak, the youngest was five months old and the oldest over 12 years. The breed incidence was as follows:—One Cairn, one Chow, one dachshund, one greyhound, one smooth fox terrier, two wire-haired fox terriers, two heavy spaniels, two cockers, one Airedale, one rough collie and the rest mongrels. The other cases were as varied in breed and age incidence. The dogs have come mainly from Blackburn, but a few have come from surrounding towns.

The disease commences with pyrexia of 105° to 106° inappetence and listlessness. Little other than the above is noted until the main symptoms appear, which become obvious almost overnight, since the foregoing symptoms may be so slight and of such short duration to be disregarded by the owner. There is a sudden slight swelling of the submaxillary lymph glands, which may or may not be progressive—varying in individual cases. In some the submaxillary glands continue to swell for a few days until they have attained the size of a hen's egg. In others, after the preliminary slight swelling, the glands remain unaltered in size, but the upper cervical glands suddenly swell and may go on to attain tomato size or even larger. Slavering is practically always prominent at this stage, and there may be extreme difficulty in swallowing. This is, of course, most marked when the submaxillaries are badly swollen. If no treatment is commenced at this stage, further glands begin to swell down the neck, *viz.*, mid and lower cervicals, until, as happened in two of the 1944 cases, the axillaries become involved. The glands may be affected uni- or bilaterally, but when the disease progresses down the neck as was seen last year, it has a unilateral tendency. Thus a bad case showed the following:—Both submaxillaries (slight swelling), one middle cervical (grossly swollen), one lower cervical (opposite side, slight swelling), one axillary (same side as middle cervical, grossly swollen). All variations have been seen from cases with only a single gland affected to one such as the above and the sizes attained at the height of swelling may vary from tomato size to that of a jaffa orange. After the preliminary swelling of the submaxillaries the further progress of the disease is markedly altered by the type of treatment adopted. If, as happened last year, treatment is concentrated on the swollen glands, that is to say, local external treatment, the disease after progressing as far as the axilla has a tendency to clear up slowly, leaving a localized gland infection. During that series we were faced with the problem of swollen glands (submaxillary, cervical, and axillary either singly or in combination) which under treatment would neither form an abscess nor subside. The glands became extremely firm, and it was only after vigorous counter-irritation that they were finally lanced and packed until

they subsided. In some cases this took weeks, although the dog, in itself, was completely recovered at the end of the first ten days. In one case a swollen mid-cervical gland which had gone as hard as a stone was finally removed surgically under local anaesthesia. There is no vomiting throughout and, rather curiously, no cough. The systemic disturbance may be marked in the early stages, but is shown only by complete anorexia and lassitude. In the series this year the glands have pointed and burst—generally within a fortnight, some within a week. Only three of these acute cases have progressed further than the mid-cervical glands, and where treatment was begun early the disease was checked whilst at the stage of submaxillary swelling. This, we believe, is largely explicable by the difference in method of treatment employed during this year's outbreak. A few cases have shown gross oedema of the jowl and dewlap, extending sometimes upwards on to the face (seen in the spaniels especially) resembling more than anything cases of angioneurotic oedema. In one spaniel the eye sockets were reduced to mere slits. Any ocular or nasal discharge which occurs is slight, rather gleety in consistency and grey in colour. When the swollen glands have become converted into large abscess sacs, they point and burst, discharging a great amount of thick red pus. The temperature rapidly drops to normal after the pus has been evacuated and the swelling has subsided.

Sub-Acute Form

A few cases have been seen where the disease assumed a milder form, and we have grouped them into what might be termed sub-acute "glandular fever." These dogs showed very little general malaise, the effects of the disease being confined to local glandular swellings. The glands affected have been mainly the submaxillary and cervical, but one dog in last year's series had involvement of the axillary gland on one side. This dog was subsequently destroyed at the owner's request and a *post-mortem* examination made (see later). Treatment of these cases was confined to local treatment of the glands.

Chronic Form

Three cases of the chronic form have been seen this year. In all these the disease has commenced as an acute type, which yielded to treatment, but complete cure evidently was not effected since all three dogs relapsed after an interval of approximately six to eight weeks, displaying symptoms which were hardly referable on first examination to the previous acute disease. As will be seen from the above, the disease developed into the chronic form through a relapse after supposed cure and were not chronic cases throughout the entire course.

Post-Mortem Examination

Acute and Sub-acute.—A collie was destroyed in this year's outbreak during the acute stages of the disease, and a Scottie in last year's outbreak suffering from the sub-acute form—both at the owner's request. In the collie the gland involvement was confined to the submaxillaries, but the whole face was grossly enlarged (septic face). On *post-mortem* examination the glands were soft and in varying stages of abscess formation surrounded by oedematous tissue infiltrated with pus forming fistulae to the outside. In the Scottie the glandular involvement extended as far as the axillary glands, but was more of a sub-acute character. The glands were firmer with broken down centres containing pus.

Chronic.—We have lost three cases which have all been destroyed suffering from the chronic form. We have made a *post-mortem* examination on two of these dogs. One of the dogs developed ascites and was destroyed when this unfortunate sequel occurred. On *post-mortem* examination the entire lymph gland system of the body was found to be involved in the disease. The mesenteric glands in this case formed an enormous tumour mass throughout the substance of which various loops of bowel and organs were interposed (pancreas, small intestines. etc.). All the other lymph glands of the body were enlarged to some degree. This tumour mass contained a necrotic centre with numerous subsidiary abscess cavities. The spleen showed several similar swellings with abscess centres, but was not generally enlarged (cf. Hodgkins' disease, leukaemia and the splenic nodular tumours of old dogs). A second dog which relapsed into the chronic form showed similar generalization of the disease, but the chest lesions were most prominent in this case, the mediastinal glands being grossly enlarged. Treatment of these cases was for a time remarkably successful, but final relapse occurred in all three. All three cases were on similar treatment, *viz.*, gross doses of sulphathiazole or sulphamezathine and at the same time staphylococcal toxoid and Bayer Yatren E. 104, repeated every four or five days. Under this treatment the glands (those which were palpable, *e.g.*, submaxillary, popliteal and prescapular) slowly subsided.

It was assumed that the internal glands were subsiding at the same time, and judging by the clinical improvement this probably occurred. In spite of continuation of this treatment relapses took place, and although in all three cases the superficial glands remained unaltered in size, evidently the internal progress of the disease, after being checked for a time, progressed until ascites developed in one case and gross emaciation in the other two, necessitating destruction in every case.

Mortality

There have been five fatalities from the outbreaks. Nevertheless, the disease has not been regarded as in any way serious, since response to treatment is prompt; there is, however, evidently a serious tendency to relapse unless special precautions are taken to ensure that a complete cure is effected during the acute stage of the disease. This is synonymous with ensuring that no localized gland infection is still present when the case is discharged as cured. In the three cases which relapsed this year the focus of infection which flared up and precipitated the relapse evidently lay in the submaxillary glands, *i.e.*, the original focus of the disease (from a tonsillar infection?)

Summary of Treatment Adopted

During the first outbreak we concentrated on local external treatment of the swollen glands, advising hot fomentations, rubefacients and mild blisters, depending on the stage of the disease (acute or sub-acute form). We lanced and packed the glands after abscess formation when and where it was thought necessary. Little attention was paid to the systemic upset other than the use of antipyretics and bland antiseptics (such as glycerine thymol) given by the mouth. This was a mistake, as we realized during last year's outbreak when we put the last few cases on to the sulphonamides. This was instituted too late in these cases, since the swollen glands were already organizing and most of the systemic disturbance had passed off. In this year's series we began systemic treatment immediately, neglecting the swollen glands other than advising hot formentations and mild rubefacients. The results were excellent and to a certain extent an indication of the value of the different members of the sulphonamide series of drugs, since individual cases were on different types of sulphonamide. Response was most marked with sulphathiazole and least with sulphanilamide, which is exactly what we expected from the use of these drugs in other canine diseases, notably distemper. It may be summarized as follows:—Early treatment with sulphathiazole limits the glandular involvement to the submaxillaries, but early treatment with sulphanilamide may not check the disease until the cervical glands have become involved: no sulphonamide treatment and the disease may progress to the axillaries. Towards the end of the series every case was put on one or other of these drugs (sulphathiazole or sulphamezathine), unless the disease had been in existence for a week or so and the systemic disturbance had cleared up to a large extent (or the case was sub-acute), when sulphanilamide was used. In general, when the most potent drug is used (sulphathiazole) the systemic upset quickly subsides and the glands point and burst in a few days, whereas if sulphanilamide is employed, the general malaise lasts longer and the glands show a tendency to organize slowly rather than come up and form abscesses. With no sulphonamide treatment, as already mentioned, the glands may become as firm as stones, eventually requiring surgical excision. For a discussion of the treatment adopted in the three chronic cases, see earlier.

General Discussion

Owing to pressure of other work, no attempt was made during the outbreak to send any material for bacteriological or histological examination. "Glandular fever" seemed best to describe the condition, and it was left at that, although the comparison with strangles in the horse and glandular fever in man was obvious. We can find no modern reference to the condition, but ample references amongst the older writers. The best reference is contained in Wallis-Hoare's "System of Veterinary Medicine." There are three distinct references contained in the work, namely, Vol. II, page 465, Vol. I, page 686, Vol. I, page 820. Two authors are concerned—Wallis-Hoare and Henry Gray, with a cross-reference to Friedberger and Frohner ("Veterinary Pathology"). Summarizing the contents of the three references we find that the condition was recognized as a distinct entity, but that there was a difference of opinion as to its exact aetiology. Henry Gray believed the condition to be a suppurative or phlegmonous form of distemper and treats it as such, but is not altogether convincing. Wallis-Hoare has an open mind on the question, and gives the complaint under "Phlegmonous Pharyngitis" with a cross-reference to Gray's article under "Distemper." There is a third reference to it by Wallis-Hoare under "Strangles," where it is again obvious that he is open on the question. He also refers to Friedberger and Frohner. The references in this latter work are to be found in volume I, page 29, under "Pharyngitis," and volume II, page 166, under "Strangles." It will be seen that these references do not refer to one and the same entity, although the authors evidently believed

that they were. Thus Wallis-Hoare (volume I, page 821), giving a cross-reference to "Canine Strangles," as described by Friedberger and Frohner, volume II, page 166, is under the impression that the latter authors are describing a similar complaint to that dealt with in Henry Gray's article on the suppurative form of distemper, although they specifically state that it is an "original infective disease which is independent of distemper and pyaemia," and Wallis-Hoare is himself aware of this, for he quotes the phrase given in parenthesis. But this is not the case, for Friedberger and Frohner, under "Canine Strangles," are referring to a well-known complaint in young pups generally only a few weeks old which is, as they describe it, "a purulent follicular inflammation of the lips with purulent lymphangitis and purulent lymphadenitis of the head, which may lead to pyaemia, and which consequently possesses a certain similarity to strangles." This condition is one well recognized in this practice, and, so far as our knowledge goes, has no connection with the one described in this article. Also in Friedberger and Frohner, volume I, there is, on page 17, a reference to the condition described by the same authors under "Canine Strangles" in volume I, page 166. The other reference given in Friedberger and Frohner (volume I, page 29) and the two in Wallis-Hoare (volume II, page 866 and volume II, page 465) do refer to one and the same condition, which is identical in most respects with the one described by ourselves.

The description of "Parotis-Mumps," given by Muller and Glass (fifth edition, page 70) tallies in some respects with glandular fever, and is probably the same complaint, but the description is vague. (See illustration on page 72, typical of acute glandular fever, and note the mention of it as an epizootic.) Also on page 359 under "Distemper" the following occurs: "Other abnormal conditions are found in distemper, such as . . . an abnormal swelling of the thoracic and abdominal cavities" (chronic "glandular fever"?)

On page 125 of his book on distemper, Hamilton Kirk, under "Miscellaneous Symptoms—Suppurations" observes: "The condition is also sometimes associated with a suppurative process of the laryngeal or pharyngeal regions, or even of the internal organs." He also quotes from Gray in regard to fistula formation in the throat region.

The striking similarity between the complaint and glandular fever as seen in man is self obvious. For a description of the disease as seen in man, see Taylor's "Medicine, etc." We have been able to collect the above references from the works which we have at hand and hope that nothing pertinent has been missed, but we shall be glad to learn of any further references to the condition.

We disagree with Gray in regard to the connection of this condition with distemper and do not find his description to correspond as closely with ours as does that of Friedberger and Frohner. It is sufficient here to state our opinion that the disease as we observed it had no connection whatsoever with distemper, which is endemic in this town, without going into details to point out the great differences; neither do we believe, as Gray believed, that this condition is a "complication" or "form" (secondary invaders) of distemper: that does not mean, however, that the one might not be coincident with or superimposed upon the other, and we are of opinion that we saw such a case in this year's outbreak.

So far as we are aware, the aetiology of the condition in the human is still in doubt, but staphylococcal or streptococcal origin has been suggested. It is also interesting to note that the problem of differential diagnosis is very similar in the human—and as difficult—as we can imagine it would be in the dog, in regard to established cases of the sub-acute or chronic form when presented for the first time. Fortunately all the cases seen have occurred within the period of the epidemic and a diagnosis was never in doubt, but the last few cases seen of the chronic form of the disease would have presented problems in differential diagnosis if the previous acute attack had not been known. The occurrence of the disease in this practice has cast doubts in our mind as to the correctness of some of our previous diagnoses of Hodgkin's disease (pseudo-leukaemia), or leukaemia, or tuberculosis, or lymphadenoma in the dog where subsequent *post-mortem* examination was not made: also as to whether the prognosis in these instances was justified if the case was actually one of glandular fever—since, although we have lost all our chronic cases of the disease, an improvement was effected in every case before final relapse. Clinically the condition suggests to us a staphylococcal complaint occurring in an acute form which can be effectively cured with prompt treatment, but where treatment is late or half-hearted, or the animal has resisted the disease and is presented in a sub-acute or chronic form, the disease progresses to a fatal conclusion either in several weeks or in months. It would be interesting to learn whether there have been any reported cases of human glandular fever, or an increase in that disease, coincident with the above outbreaks as described in dogs.

MEMOIR

John W. McIntosh, M.R.C.V.S., F.R.S.E.

Past President of the Royal College and the N.V.M.A.

The passing of John W. McIntosh on Monday last, announced with the deepest regret in another column, will be deeply mourned by many, both members of the veterinary profession and others. To all, he stood as the typical, forthright Scotsman. To those who were privileged to be his friend, he was known as one generous, kindly and loving, yet possessing a strong personality and courage, which he used to fight injustice being done to others and to uphold the rights and dignity of his profession, which he so dearly loved and served with such distinction.

Mr. McIntosh's chief professional activities were associated with the very important post of Veterinary Adviser to the firm of Hay's Wharf Cartage Co., Ltd., in London. No better man could have been chosen, as he was bred and born among the highly skilled agriculturists, at Pitlochry, Perthshire, Scotland. At the time that he undertook this duty this big firm of cartage contractors was almost entirely dependent on the horse to carry out its work. When after nearly 30 years of continuous service he retired, many tributes were paid to his outstanding work in buying, and maintaining, this big stud in such splendid condition.

Soon after qualifying in May, 1893, McIntosh settled down to build up and establish a big practice at Dalkeith, and was not long in showing that he possessed an administrative mind in addition to his professional skill. He received appointments as Veterinary Inspector under the Diseases of Animals, and Public Health (Scotland) Acts, and Veterinary Adviser to the Edinburgh and East Scotland College of Agriculture. He was elected a Life Member of the Highland and Agricultural Society of Scotland, while he served on his local Town Council.

In 1911 "For services rendered to Veterinary Science" he had conferred upon him the distinction of F.R.S.E.

On his arrival in London in 1908, John McIntosh turned his attention to the political side of the profession. He very soon joined the N.V.M.A. and, indeed, was largely connected with the resuscitation of that body, serving on many of its committees and Council, and eventually becoming its President for the year 1927-28. He was an enthusiastic member of the Central and Royal Counties Divisions, and occupied the Presidential chair of both bodies, the Central Society awarding him the coveted honour "The Victory Medal."

In 1921 the profession elected him a member of the Council of the Royal College of Veterinary Surgeons and he retained his seat up to the time of his death. During this long period he served on many committees, and as a delegate to conferences, etc. 1934 saw him elected Vice-President, and the following year he was installed as President. The office of Treasurer was entrusted to him in 1937. And so his profession had recognized his worth, by according practically all the high honours it was able to bestow upon him.

With all these "cares of State" he yet found time, in association with his daughter, to take more than a passing interest in the work of the Victoria Veterinary Benevolent Fund: his sense of justice and his kindheartedness in allotting grants to deserving applicants was most marked.

As all who knew him foresaw, Mr. McIntosh was not content to spend his retirement in well-earned ease. At Crieff he was soon co-opted to the Town Council and before long he was elected a Bailie (or Magistrate). He was Chairman of several committees, including the Police and War Emergency Committees. He interested himself in educational matters and was one of Crieff's representatives to the County Council. Elected an Elder in his Church, his service in Crieff was, indeed, like his much longer service to his profession, sincere and completely unselfish. His activities were highly appreciated and he was most popular.

He attended many of the meetings of the Scottish Divisions and was elected an honorary member of the Scottish Metropolitan Division.

The above record shows that J. W. McIntosh had from the first maintained a deep interest in the well-being and advancement of his profession. Those who knew him best will the most vividly be aware how greatly this and all his other activities were helped by his charming personality. [*Continued at foot of next column*

IN PARLIAMENT

Veterinary Surgeons in the Forces

In the House of Lords on Wednesday of last week Viscount BLEDISLOE asked how many trained veterinary surgeons were serving with His Majesty's Forces at the end of the European war, and how many are still so serving; and, whether, in view of the seriously deficient average milk yield of our British cattle, attributable to avoidable bovine diseases, and the prospect of there being no appreciable improvement until more practising veterinarians are available in Great Britain, the demobilization of those still in the Forces could be accelerated. He moved for Papers.

The noble Viscount said: My Lords, this is really a supplemental Motion to that which has just been withdrawn (Viscount Rothschild's, *re* "The urgent need for compulsory pasteurization of milk"—*see below.*) I only desire to mention in this connection that I understand there are still about 500 veterinary surgeons in the Forces and that, although provisional arrangements have been made for the release of a large proportion, very few have been actually released. As the total number of veterinary surgeons in practice in this country is now about 2,000, the release of 500 more now in the Forces will very materially assist plans for the control of disease in our dairy herds. I would, therefore, ask the noble Lord opposite for a detailed reply to my question. I beg to move for Papers.

THE PARLIAMENTARY UNDER-SECRETARY OF STATE FOR WAR (LORD NATHAN): My Lords, it was thought more convenient, in consultation between the noble Viscount opposite and myself, that, rather than interrupt the flow of the milk debate by reference to the subject of this second Motion, the noble Viscount would make his speech on that Motion and I would reply to it on this. I wish to say to the noble Viscount at once that the Government are fully sympathetic with the objects which he has in mind, and indeed that follows from the acceptance of the principle of the last Motion by His Majesty's Government through the mouth of my noble friend Lord Ammon. The noble Viscount will, of course, not suggest, and does not suggest, that veterinary surgery is the sole factor in dealing with this difficult and important question of bovine diseases. His Majesty's Government, however, recognize that it is a most important factor, and it is from that standpoint that, in giving this answer on behalf of the Government, I approach the matter.

I ought to tell the noble Viscount that, comparatively, the Forces are concerned with only a handful of veterinary surgeons outside of those who serve in the Royal Army Veterinary Corps. They are so insignificant in numbers outside the Army Veterinary Corps as to be quite negligible, if indeed there are any now at all. But in answer to the question which the noble Viscount specifically put, I may say that at the end of the European war the number of veterinary surgeons in the Royal Army Veterinary Corps was 418, now reduced to 348, of whom 53 are Regular officers. In the desire to accede to the views expressed by the noble Viscount and those on whose behalf he speaks, and recognizing the importance of the objectives in view, arrangements have been made under which during the next two months a further 50 veterinary officers will be released. The result will be that at that time there will be in the Army Veterinary Corps only 298 veterinary surgeons, of whom 53 will be Regulars, so that the total number who could possibly be made available for practice in civilian life would be about 240, which is only 5·4 per cent. of the veterinary surgeons who number upwards of 4,000.

I think the noble Viscount will agree that the action taken by the Government indicates the Government's desire to be helpful in the matter to which he referred. I interested myself in the facts of this position after seeing the noble Viscount's Motion on the Paper, because I was rather surprised and I wanted to know why veterinary surgeons were required in such numbers in the mechanized Forces of to-day. I have satisfied myself, however, that there is a real need. There are only 30 such officers operating in the United Kingdom, and there are very many more animals to be looked after by the veterinary surgeons than I had thought—upwards of 27,000 Army animals. The Veterinary Corps is also, of course, responsible for dealing with the remounting of the Army in the various theatres, and there are other services which they have to fulfil. I may say to the noble Viscount that it is not the intention that any new entrants should be taken into the Army Veterinary Corps until the post-war establishment is definitely settled.

Now I will go, if I may, a little beyond the actual question put to me by the noble Viscount, because I wish to make it clear beyond a peradventure that the Government attach great importance to the whole question of the provision of properly qualified veterinary surgeons and regards that as a necessary condition of creating an agricultural industry of the quality which has been sought and which is so necessary for this country. Consequently the Government adopt in the main the recommendation of the Loveday Committee that has been announced by my right honourable friend the Minister of Agriculture in another place. That will involve not merely a call upon Government funds, which is recognized and expected, but also arrangements with the universities for the purpose of putting education and qualification in veterinary surgery on the same footing as education and qualification in the medical profession. It will require legislation. I noted what the noble Viscount said about that legislation being non-controversial. I hope and believe that that may be so. There are, of course, great demands upon the legislative programme, but I will draw the attention of my right honourable friend the Minister of Agriculture specifically to what the noble Viscount has said upon this point and the importance which he attaches to it. His voice carries great weight having regard to the position he holds on the technical bodies in agriculture, quite apart from the position he holds in the esteem of your Lordships in this House.

If my words could reach outside the walls of your Lordships' Chamber, I would say to the young men and women who are seeking a profession, and to their parents, that those young men and women might well consider the health, the interest, and the public usefulness to be derived from adopting the profession of veterinary surgeon as a career. It is the desire, the aim and the intention of the Government that veterinary surgery shall be a profession worth while, and that that profession shall be improved in standards and in standing, so that it takes its place in its own sphere on the same basis in the same public esteem and with the same usefulness as the medical profession does in its sphere.

Viscount BLEDISLOE: My Lords, I am greatly obliged to the noble Lord opposite for the very full reply of a reassuring character which he has given to the House. In the statement made in another place on the subject of the adoption of the Loveday Report it was particularly mentioned—and was very reassuring to the agricultural community—that what was called the Chancellor Report, which was a subsidiary report dealing with unqualified veterinary surgeons, would also be acted upon. I take it the noble Lord is prepared to endorse that statement, because there is no doubt that the elimination of unqualified veterinary practitioners will do very much to promote an inflow of recruits of the right type. There are too many quacks and Mrs. Gamps, if I may call them so, in the veterinary profession* to-day who have indirectly the effect of deterring the right type of educated young man to enter the profession. He would be more likely to do so on the Government's decision, especially if they make up their minds to put the profession on the same footing in status and in emoluments as that of the medical profession in this country. In these circumstances, I beg leave to withdraw my Motion.

. . . . .

Pasteurization of Milk

Prior to consideration of the above Motion, Lord ROTHSCHILD rose to call the attention of His Majesty's Government to the urgent need for compulsory pasteurization of milk in as many parts of the United Kingdom as is practicable; and to move for Papers. In the course of his speech, Lord Rothschild said that he was fortified to a certain extent by the fact that the Motion had the backing of a number of learned institutions such as the British Medical Association, the Society of Medical Officers of Health, the Joint Tuberculosis Council, the Royal College of Surgeons and the Royal College of Physicians.

It would not be necessary for him to say much about the benefits of pasteurized milk or, as it is known in these days, heat treated milk. Their Lordships were aware that a large number of people die each year through drinking milk contaminated with the bovine tuberculosis germ. He would not weary their Lordships with statistics, but would merely mention that if all the members of that House were killed twice a year—and he thought that their Lordships would agree that this would be a matter of some gravity—the number of deaths would be of the same order as that caused in the United Kingdom by drinking raw milk contaminated with the germ of tuberculosis. He need not remind their Lordships that the number of casualties from this germ far exceeded the number of deaths; but no precise figures were available to him on this point, though the number of casualties had been estimated at about five times the number of deaths. If they put the number of deaths per year at 1,600, the number of casualties would be

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The veterinary profession has, by his death, lost an outstanding figure. His dignified presence, and his words of wisdom and guidance, will be sadly missed in the Council Chamber of 10, Red Lion Square.

Our heartfelt sympathies go out to Mrs. McIntosh, his great helpmeet, and to Mrs. Nickinson, his devoted daughter, in their grievous loss.

P. J. S.

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* Use of the term "veterinary field" doubtless would have represented Viscount Bledisloe's true meaning and intention.—*Editor.*

between 7,000 and 8,000. These casualties, which required months of hospital treatment, were a source of misery and anxiety to their families and grave expense to the State.

Of course tuberculosis was not the only disease caused by drinking raw milk contaminated with germs. Undulant fever claimed an unknown number of victims each year—unknown because it was a difficult disease to diagnose—while outbreaks of typhoid and paratyphoid fever, dysentery, food poisoning, scarlet fever, and diphtheria were known to be caused from time to time by the drinking of raw milk.

It would appear obvious from the few words he had said that considerable benefits would accrue to the population of this country by removing a perfectly clear cut source of disease and death from the population's milk; and on the assumption that this side of the case was not in dispute, he would turn to the other side which concerned the arguments put forward by the opponents of pasteurization. Might he say at the start that he neither could nor should attempt to deal with the economic aspects of this matter? Their Lordships were well aware that one of the criticisms of any scheme involving the compulsory pasteurization of milk in the United Kingdom was that it would have an adverse effect on the small producer-retailers. Their Lordships might have something to say about the relative merits of killing off numbers of the population each year and maintaining the economic interests of a relatively small section of the community, though the words "as far as is practicable" in his Motion indicated that he appreciated the difficulties of extending any scheme of heat treatment to special or rural parts of the country.

Having dealt with "the non-existent difference in taste," and the objection that pasteurization takes what is called "the life" out of milk, Lord Rothschild proceeded: "Though milk is one of nature's best foodstuffs, it is by no means a perfect one, and no one can live exclusively on milk without additional minerals and vitamins. Consequently the fact that a certain amount of these substances is removed by heat treatment is of much less significance than the opponents of heat treatment would have us believe. The opponents of pasteurization—and many people who have fallen victims to their propaganda—sometimes say that pasteurization will remove the incentive to clean milk. Such criticisms display a lack of understanding of the difference between clean and safe milk, and also impute a somewhat alarming degree of ignorance to the Government in imagining that if compulsory pasteurization were introduced, the Government would remove the existing regulations about the cleanliness of milk. The regulations about the cleanliness of milk are directed towards preventing milk being contaminated with dust, blood, water, cow dung, and milk-souring bacteria, all of which at one time were an almost natural constituent of milk in this country. Heat treatment, on the other hand, is intended to destroy disease-producing germs. Though it may render milk safe for human consumption, heat treatment cannot render dirty milk clean. Both clean milk and heat treated milk are desirable for different reasons.

"The opponents of pasteurization also say that it destroys the need for the T.T. and attested herd schemes. Here again there is a lack of understanding of the objectives of the schemes. The T.T. and attested schemes are directed towards improving the health of our cattle as well as towards producing germ-free milk. The heat treatment of milk is directed primarily towards improving the health of our population and reducing the unnecessary number of deaths each year. Quite recently in this country an outbreak of dysentery occurred and was traced without a shadow of doubt to milk from a tuberculin tested herd. There is nothing extraordinary in this as T.T. milk is always exposed to the possibility of contamination *after* the milk has left the cow, and we shall never be able to prevent farmhands, and others concerned with the milk, from unwittingly being carriers of disease. But suppose we accept the risks that caused this recent outbreak of dysentery; even then, it will take many years for a high percentage of our cattle to become attested or to produce T.T. milk. Experience in the United States, where a costly slaughter policy has been combined with a T.T. herd scheme, makes it clear that it would take a minimum of 25 years for an important percentage of our cattle to come into this class, and I doubt if we shall be prepared, or even able, to slaughter cattle on the scale that has been done in the United States. Twenty-five years means many unnecessary deaths and very many unnecessary casualties. Your Lordships may agree with me that anyone who says that the T.T. and attested schemes can achieve what we need in a comparatively short space of time must produce good evidence for such a statement if it is to carry conviction.

"I now come to the criticism which the opponents of pasteurization put forward with a success which only real nonsense seems able to engender. These gentlemen say: 'If we take all the noxious germs out of milk, we shall be preventing the population from acquiring a natural immunity to disease.' Your Lordships may agree with me that the cost of this immunity, even if it existed, is somewhat high, and one that might not appeal to the mothers of children who have died from bovine tuberculosis. But apart from this, why do we not drink water contaminated with germs of enteric fever or any of the other diseases that are sometimes carried by water? Are we not incurring a very grave risk in accepting the dicta of Ministries of Health of every political shade, of local authorities, of the medical profession, of scientists, or even of the ordinary man? This frightful risk in which most of us are involved by drinking pure water, is one which we appear to sustain with comparative equanimity and impunity. I wonder why a different view is taken by some people because we substitute the word 'milk' for the word 'water.' The truth is, my Lords, that this argument, though on occasions it appeals to those who have not thought much about it, is one that is sufficiently illogical, if not vicious, to be rejected out of hand.

"There are three objections to pasteurization which are more serious than those to which I have already referred. The first concerns the possibility that the institution of compulsory heat treatment would not only put small producer-retailers out of business, but would reduce the nation's milk supply. Of course if the Government were to pass some totalitarian Bill making it illegal to sell any form of milk anywhere in the United Kingdom which was not pasteurized, this would be the case. But my Motion is not worded in this way, and nobody in their senses would attempt such a measure. I submit to your Lordships that the compulsory institution of heat treatment in towns, shall we say with a population of more than 20,000, would have no effect whatsoever on small producer-retailers; and, so far from reducing the nation's milk supply, it might well cause an increase. During the war literally thousands of gallons of raw milk were poured down the drain as unfit for human consumption, and it was this fact which caused the noble Lord, Lord Woolton, to institute the heat treatment of milk as an urgent measure, thereby saving the nation thousands of gallons. I do not know whether any raw milk is poured down the drains nowadays, but if by any chance it is, perhaps a similar saving would occur if the Motion in my name were adopted.

"May I repeat that the institution of compulsory pasteurization in towns with more than 20,000 inhabitants need have no effect on the little man and the producer-retailer? It is no answer that about 70 per cent. of the nation's milk is already pasteurized. This is not a matter for satisfaction at all when we remember the number of deaths and casualties each year from the other 30 per cent. A further serious objection that might be raised is that heat treatment equipment would have to be bought in the United States and would therefore cost dollars, which we either do not have or which we cannot spare for this purpose. The Dairy Engineers' Association, of which most of the firms who make heat treatment plant are members, inform me that not one screw for this equipment would have to be bought in the United States.

"Finally, I must, I think, mention an objection to pasteurization which I put into the serious category though some of your Lordships may feel it hardly merits this treatment. I refer to that type of person who knows from personal experience and observation that the earth is flat and not round, and who says such things as: 'What nature produces is good enough for me, so better not tamper with it; it might be dangerous; I like my milk raw.' Your Lordships will be well aware that the idea of not tampering with nature is apt to get one into difficulties from time to time. When one is dying of pneumonia one must not tamper with the course of nature by administering penicillin. One must not tamper with nature during an acute attack of appendicitis by having an operation. Or even if one were to be so unwise as to allow an operation to take place, one must not tamper with nature by administering an anaesthetic. If anyone were fortunate enough to get hold of a steak in the future, one must not tamper with nature by cooking it. As a whole we tolerate the peculiar activities of cranks and eccentrics with a certain affectionate amusement, but when they affect the lives and health of the people of our country, I think we should give up this tolerance and at the same time explain to the uninformed why.

"When one ponders over the various methods we have of killing off our dwindling population, one cannot help returning to the melancholy spectacle of road deaths, and one cannot help being thankful that committees constantly sit and discussions constantly go on to devise methods of solving this tragedy. But in the case which I submit to your Lordships there is no need for committees and little need for lengthy deliberation. The committees have sat: the deliberations have taken place, and in fact schemes have already been set out—I refer to the one of the noble Lord, Lord Woolton, during the war—for introducing compulsory pasteurization. The exigencies of the war were doubtless responsible for the shelving of the noble Lord's scheme. The exigencies of the peace make the institution of compulsory pasteurization an urgent necessity. Any Government which does not implement such a scheme, or at the very least accept the principle for large towns must, in my respectful submission, incur a large share of responsibility for the death and disease which result each year from the people of this country

continuing this ill-advised and unnecessary practice of drinking unpasteurized milk. I beg to move for Papers.'

Earl De La Warr said that all his prejudices were thoroughly against pasteurization. It must be better to produce clean milk rather than to kill germs in dirty milk. None of them wished so to increase the capital cost of distributing milk as not only to wipe out many thousands of small men, who might have to cease distributing milk, but also to drive many out of production. In these days of shortage, this was indeed the very last moment to take the slightest risk of doing anything like that.

"We must be careful to do nothing that will in any way tend to make the industry feel that it is now less necessary to clean up the herds and to clean up the farms. There is no doubt whatever that the overwhelming view of the medical and scientific professions —or at least of the vast majority, anyway, of those engaged in them —is in favour of pasteurization, at any rate of our urban supplies of milk that have to be bulked.

"What is the present position? Certainly it is not as desperate as is sometimes suggested. No one, for a moment, denies the gravity of the figures that have been put before us by Lord Rothschild, nor indeed shall I attempt to dispute them. But I do not think we should forget that really immense progress has been made in this matter during the last few years. So far as I can ascertain, the present position is this. About 80 per cent. of our total milk supply is served to the public by the distributive trade. Of that milk, supplied in that manner, no less a proportion than 90 per cent. is pasteurized to-day. I think you would find it very difficult to get any milk now in London that, in fact, is not pasteurized. That figure which I have just given, 90 per cent. of the 80 per cent., roughly agrees, I think, with the noble Lord's figure which was, if I remember rightly, 70 per cent. of the total milk supplies. On these figures it is clear that to apply compulsion to the bulk of that particular part of the trade would cause no difficulty at all. The noble Lord has suggested compulsion in the large urban areas. I think he mentioned places of 20,000 population and upward. Certainly I would be prepared to agree with him there if that is the population limit upon which he draws his line, but I would except all milk, even in those areas, that is up to an accredited standard of cleanliness. I feel rather strongly that if a member of the public would prefer to be supplied with fresh milk of an accredited standard of cleanliness, then he or she ought to be allowed to purchase that milk even in a large urban area.

"We now come to the 20 per cent. of the total supply which is delivered by the producer-retailer. Of this, only a very small quantity is pasteurized. I think the noble Lord would agree that probably some of it is pasteurized, but a certain proportion of it is of certified or finer grade—that is T.T. or Accredited. Of the total milk supply of the country to-day, 12 per cent. is of T.T. standard and 25 per cent. is Accredited. I hope your Lordships will forgive me for putting these figures before you, but I think it is rather important to try to get an accurate picture of the sort of problem with which we have to deal. I think that we can do so, perhaps, from what I have said. The position, though serious, is not quite as desperate as some people say. The only really difficult problem with which we are faced is that connected with the producer-retailer. There are about 50,000 of these in this country, handling about 20 per cent. of our milk supply. They are usually small men and they are usually serving small or urban communities, or rural communities outside the range of the large distributor, and areas which without these men would frequently have great difficulty in obtaining any milk at all. The producer-retailers, therefore, are performing a useful service which in many cases nobody else would be prepared to perform.

"The question we have to decide really is, first, at what pace can we tackle this problem of cleaning up the milk supply delivery by this section of the trade, and, second, in what direction do we desire to travel? On the question of pace there is no doubt that if we try to go too fast we shall merely drive these men out of business, and we shall be deprived of quite a large quantity of milk which we need to-day. On the question of direction I venture to say that whereas pasteurization is quite inevitable for the large urban areas, by far the better manner of dealing with the problem of the producer-retailer is to tackle the problem of cleaning up the herds and cleaning up the farms. Not only is the capital cost of pasteurization far too heavy to be borne by this section of the trade, but where the bulk of the milk is taken from the producer to the consumer, where the milk is produced in a clean manner it can maintain its cleanliness. Therefore in the case of the producer-retailer, provided that the milk is clean, I can see no very great reason for pasteurization at all.

"Here, my Lords, I venture to make a very definite proposal, or perhaps I should say set of proposals, to His Majesty's Government and to the Milk Marketing Board. Let us make a start, here and now, with compulsory pasteurization in large urban areas of 20,000 population or over. Then let us steadily extend it elsewhere to those producers and distributors who are not prepared, or not able, to offer to the public milk of an agreed and designated standard. Give them a reasonable period to reach that standard, but have a definite time limit. I would suggest that we should have something like a ten-year scheme, divided up into different stages; that by the end of the first two years all producer-retailers should have attained the present accredited standard; that by the end of the first five years they should have to attain a standard very considerably above the accredited standard; and that by the end of ten years they should have to attain the full tuberculin-tested and attested-herd standard. And here I would like to interpose a remark. In doing this do let us see in future that milk of a designated standard is kept separate from other milk. A great deal of effort is required, on the part of the producers, and a great deal of public money is being expended at the present moment, in encouraging the production of clean milk which is mixed with all the rest the moment it leaves the farm.

"Intensify the Campaign for the Cleaning up of Herds"

"Above all, do let us get going at once. One thing we do not want to do is to continue drifting along as we are at the present moment and then suddenly be driven into some panicky and drastic steps. Let us here and now make up our minds as to the right long-term policy to pursue, and take our time in pursuing it, but with a definite time limit set for the end. During this ten-year period we should intensify the whole campaign for the cleaning up of herds. Firstly, the veterinary profession, the advisory and education services of the Ministry and of the committees, milk recorders, and anybody else concerned with the milk trade, should be mobilized to this end. Sir Thomas Baxter, Chairman of the Milk Marketing Board, has already given a great lead to the industry on the subject and it is for those who have any connection whatsoever with the problem to take up that lead. Secondly, clean landlords should be asked to join in the campaign, and to do so both by personal propaganda among their tenants and by giving preference in electricity schemes, water schemes, and the improvement of farm buildings, to tenants who are prepared to come into the clean milk campaign. I should like to see a very strong appeal going out from the Government to the landlords to this effect. Of course the effectiveness of this appeal would depend a great deal on whether His Majesty's Government are prepared to ensure that labour and materials for the work to be done in cleaning up the farm buildings should be made available.

"Thirdly, there is no question that the existing performance premium for producing tuberculin-tested milk is a paying proposition for the producer. Unfortunately, the small man without capital still feels he is unable to face the initial risk and expense. It seems to me that the time has come now when the Government should consider whether they should not rather make their grant at the point where the actual loss occurs. Now the actual loss occurs usually when a farmer going into the scheme finds that a large proportion of his cows do not pass the test and have to be disposed of at a loss. We have to ask ourselves here whether we are going to change the financial basis of the scheme; would the new basis of granting assistance mean a prohibitive cost? I have tried to examine the figures, and my answer very definitely is 'No,' that in the long run it might actually be less than under the present system.

"There are about 3,000,000 cows in this country at the moment, I think. Now if one-third—and I think we would agree that that is rather a high proportion—are ultimately affected, that means 1,000,000 cows for which, at some time or other in the next ten years, some form of compensation would have to be paid. Of course the amount of compensation would be determined by the policy of the Government towards slaughter, but as barely 1 per cent. of milk from tuberculous cows is infected by tubercle bacteria I do not think anybody would urge the policy of slaughter at the present moment. At approximately £15 to £20 per cow, that means a sum of £15,000,000 to £20,000,000 would be required—rather less than the total of £4,000,000 a year or slightly over which we are paying out in premiums at the present moment. I do not recommend the immediate dropping of the premiums, but undoubtedly they will have to be considered in the future. If this were done it would make possible the scheme put forward the other day by the Chairman of the Milk Marketing Board for the establishment of free areas for the production of clean and healthy stock, for the replenishment of herds that are going into the attested-herd scheme. I think your Lordships would agree that that is an absolutely vital step to take if we are going to do anything with regard to cleaning up the herds.

"I have said a good deal on the question of cleaning up the herds during the debate on pasteurization. I have done so deliberately because it seems to me the two subjects are so vitally and intimately connected. I would say to His Majesty's Government that I do hope that they will base their policy on the

principle of a general drive dealing with the whole subject, far wider in scope than pasteurization. Let us clean up the herds. The noble Viscount, Lord Bledisloe, has a Motion on the Paper to-day dealing with veterinary education. That is all relevant. Let us push on to the greatest extent possible with the increase of veterinary education, to make sure that present methods of vaccination against abortion are pressed home. The problem of mastitis is not by any means entirely solved. But we are, I think, very hopeful. Both sulphonamide and penicillin are going to make very useful contributions in the near future. Let us see that materials and labour for building and for bringing electricity and water to the farms are all made available. In the meanwhile, bring in compulsory pasteurization, as the noble Lord suggests, for the larger urban areas, but bearing in mind all the time—and this is what I would venture to impress on your Lordships as strongly as I can—that, even in the large towns, pasteurization, desirable in itself, is no substitute for clean milk, while, in the smaller and rural communities, it may never be necessary if only we make sufficiently rapid progress in cleaning up the herds and cleaning up the farms."

Viscount Bledisloe said that he thought Lord Rothschild had laid undue stress on some of the supposed objections to the pasteurization of milk, one of them being taste, another being its effect upon nutritive value, and the third being the removal of vitamins. "Whatever may have been said in days gone by with regard to taste, I do not think any reasonable person nowadays, with any knowledge of the facts, would suggest that properly pasteurized milk is either nasty metallic, or otherwise unattractive to drink, if the pasteurization takes place as it ought to take place, between 135 and 140° F. for a matter of half an hour, with a subsequent cooling for at least five minutes to below 50° F. There should be no difference in the flavour of the milk as a result of the pasteurizing process. The same may be said with regard to the effect upon nutritive value. After all, there are several highly civilized countries in the world where the bulk of the milk is pasteurized, and has been pasteurized for many years past, and it has never been suggested—at least I have never heard it suggested seriously—that the process has appreciably reduced its nutritive value.

"With regard to the removal of vitamins, there is only one vitamin, which is perhaps all too scarce in milk, which can ill be spared, and is by neglect in the treatment of milk very often entirely removed. That is vitamin C. I do not know if your Lordships are aware of this fact, but, if you keep a jug of milk in the sunshine for half an hour, the whole of the vitamin C in the milk disappears. It is therefore most desirable, if you want to retain that vitamin, which is particularly valuable to infants and young children, that milk should not be exposed to sunlight after it has been drawn from the cow.

"I want to say quite frankly that I welcome, indeed I am prepared to endorse, this Motion of the noble Lord opposite, in favour of pasteurization, using his word, as far as is practicable, and in securing bovine health improvement. The main advantage of improving the health of our dairy cattle is to increase the yield. That is an even greater advantage than improving the quality. We have to increase the yield of milk, which is materially reduced in this country to-day by bovine disease, by tuberculosis, by mastitis in particular and by contagious abortion. It is perfectly true to say that it has frightened a good many people, and we cannot deny it, that 40 per cent. of the whole of our cattle in this country react to the tuberculin test. But we have to bear in mind, at the same time, that only ½ per cent. of our dairy cattle yield tuberculous milk, and, if we were to take the drastic steps in the matter of slaughter which are taken in the United States, where there is something less than ½ per cent. of the cattle affected with tuberculosis, of course the availability of milk in this country would be reduced. Milk would not be so available in this country, and, as a result, there would be an effect on the health of the population, and especially that of the children.

"I am also uttering this warning because there is a great deal of popular misconception on the danger to human health of milk which contains bovine tubercular germs. It is my experience from time to time to receive drafts of articles and books on various agricultural subjects with the request that I shall provide a foreword or preface. I received one only a week ago, and the proposed title of the book was, 'Your Enemy the Cow.' That book, so far as I was able to read it, contained a good deal of information, although rather exaggerated, similar to that which the noble Lord, Lord Rothschild, has submitted to your Lordships to-day. But to my mind, and I told the author quite candidly what I thought, the whole book is damned by its title. In a country like this, where the milk yield of our cattle is something less than the miserable amount of 500 gallons during a lactation period—500 gallons a year—as against 750 to 800 gallons in countries like Denmark, Finland, Holland and others; and remembering that the actual consumption of milk to-day in this country is an average of one half pint, whereas in most civilized European countries it is at least 50 per cent. more, and in many countries double, for anyone with any knowledge (a little knowledge is a dangerous thing in this connection), to frighten the public with a book entitled 'Your Enemy the Cow' is, to my mind, almost a matter for public prosecution.

"The question of pasteurization has been a matter of controversy in this country for at least a generation, and curiously enough has had very little relation to scientific facts. It has been influenced almost wholly by a fear that progress in particular directions would be obstructed. It has been opposed in the past by leading stock-owners, first as calculated to check the improvement in the health of dairy cattle by rendering even bad milk potable and safe; and secondly because, by giving the distributors better-keeping milk, it would make the producers victims of price bargaining. The distributors, on the other hand, favoured pasteurization as a means of prolonging very considerably the period for keeping milk in a drinkable and relatively wholesome condition. The medical profession, with little knowledge of farming conditions, demanded pasteurization as the most certain method of ensuring for the public a safe milk supply. Up to a few years ago the veterinary profession supported the opinion of the stock-owners because of its conviction that there was a great need for a considerable improvement in the health of bovines, especially dairy cattle, and that pasteurization would tend to check it.

"Complementary to the Improvement of Animal Health"

"These interested parties formed themselves into two groups who hotly contested the issue without appreciating the fact, now generally recognized, that pasteurization, as my noble friend Earl De La Warr has pointed out, is not an alternative to the improvement of animal health, but is complementary to it. There are some stock-owners who still oppose pasteurization, but there is no doubt that this opposition would entirely disappear if only the Government would boldly give a definite and firm assurance that they would henceforward actively promote improvement in the health of dairy cattle as well as insist on the pasteurization of milk so far as that is practicable. So long as the public are led to believe that even tainted milk can be rendered innocuous by pasteurization, the process of reducing the inordinate morbidity of our cattle will be a very slow one. It may confidently be expected that in the not distant future the consumer, the producer, the distributor and the medical and veterinary professions will agree that although efficient pasteurization may make an unsafe, bad milk innocuous to human health, it does not and cannot convert a bad milk into one of high quality.

"It is the duty of the public authorities, commencing with the Government, to see that the public are given every opportunity to procure, at a reasonable cost, safe, good milk—that is, a milk which is produced from cattle free from such diseases as tuberculosis, contagious abortion, and mastitis, and that the animals from which it is drawn are kept under good, hygienic conditions so that masses of bacteria and dirt do not gain access to it. Indeed, if compulsory pasteurization of all dairy cattle not specially designated 'T.T.' or otherwise were introduced with the knowledge that the Government had started upon a definite policy of bovine health improvement, there is not the smallest doubt that the demand for milk would expand enormously, to the benefit both of national nutrition and of the producer.

"Surely the immediate problem is whether it is practicable, even if it is desirable, to introduce complete compulsory pasteurization. Apart from the special problem of the producer-retailer with which my noble friend in front of me has, in my judgment, convincingly dealt, it is common knowledge that there is at present a shortage of both reliable pasteurization plant and of trained technical staff to ensure that pasteurization is carried out efficiently; and if it is not carried out efficiently, it may aggravate the present position rather than improve it. There would therefore seem to be strong justification for allowing the best milk produced on our British farms to be delivered raw to the consumer, at any rate for the present."

Government Reply

Lord Ammon, Captain, Gentlemen-at-Arms, said that no Government could ignore the danger of infected milk. Their plans for better quality milk had been set out in a White Paper that was strengthened by a Defence Regulation requiring a supply of clean milk in certain areas.

There were 621 rationalized milk areas in England and Wales, and schemes which the Government invited from dairymen had so far been received from one-third. No area had yet been speci-

fied. Shortage of dairymen's plant had been a difficulty, but that was being gradually overcome and small quantities of plant were being imported. It was regrettable that more schemes had not been submitted, but a more active policy would be pursued when opportunity, labour, and plant made that possible. To encourage the heat treatment of the maximum quantity of milk the Minister of Food had, since April, 1944, paid an allowance of ¼d. a gallon to milk distributors on all milk subject to that treatment. That was to be increased to 1½d. a gallon from April 1st, 1946.

Of the total annual liquid milk consumption of 1,075,000,000 gallons approximately 725,000,000 gallons were heat treated. Of the remaining 350,000,000 gallons not heat treated about 190,000,000 gallons were sold by producer-retailers, and of that about 18,000,000 gallons were from T.T. herds. The Government had been engaged in a long-term programme for the grading up of herds.

Milk was a vehicle for conveying not only tuberculosis but certain infective diseases, and also much ill-health and disability. An efficient system of heat treatment destroyed the germs in milk, and the medical department were satisfied that the food value of the milk was not thereby prejudiced. Experiments had proved that heat treatment caused changes in milk, but they had no significant effect on its value as a food. The Government were satisfied that the extension of the heat treatment of milk was essential and everything possible would be done to secure a pure milk supply.

Lord Llewellin said he hoped that nothing which had been said in the debate would make people take less milk. (Cheers.) He hoped people would not think that milk was a dreadfully dangerous substance; it was not. He urged that the Government should do all in their power to encourage a speedy cleaning up of the milk-producing industry and not allow themselves to be diverted by an increase in pasteurization.

Lord Middleton urged the Government to institute research by an impartial person into the nutritive qualities of electrically treated milk and to compare the results with the nutritive qualities of pasteurized milk.

Viscount Addison, Leader of the House, said that the Government recognized that it was absolutely essential to push on as vigorously as possible with the improvement in our herds, and they realized that the scope for improvement was immense. He understood that the efforts of the county executive committees were meeting with a good response.

The motion was, by leave, withdrawn.

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Vivisection

Mr. Viant asked the Secretary of State for the Home Department how many experiments were performed for public authorities and how many for the purpose of testing sera and vaccines during the year 1944.

Mr. Ede: I presume my hon. Friend is referring to experiments performed under licence under the Cruelty to Animals Act, 1876. The figures for which he asks have not been extracted from the annual returns of the licence holders since 1939. In that year, out of a total of 954,691 experiments, over 175,000 were reported as having been performed for public authorities and over 296,000 as having been performed, whether for such authorities or not, for the preparation and testing of antitoxic sera and vaccines or for the testing and standardization of drugs.

NOTES AND NEWS

Diary of Events

Apr. 23rd.—Meeting of the Society of Chemical Industry (Agriculture Group), in the Physical Chemistry Lecture Theatre, Royal College of Science, Imperial Institute Road, S.W.7, 2.30 p.m.

Apr. 25th.—Meeting of the South-Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Apr. 26th.—Meeting of the Mid-West Division, N.V.M.A., at Clifton (Bright's Café), 2.15 p.m.

Apr. 26th.—Meeting of the Royal Counties Division, N.V.M.A., at Oxford (Randolph Hotel), 2.30 p.m.

Apr. 26th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds University, 2.30 p.m.

Apr. 26th.—Meeting of the Sussex Division, N.V.M.A., at Shipley, 2.45 p.m. (Lunch at Horsham, 1.15 p.m.) See Notice.

May 2nd.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool (Stanley Abattoir), 2.30 p.m.

May 2nd.—Meeting of the Central Veterinary Society, at the Conway Hall, W.C.1, 2 p.m.

May 3rd.—Meeting of the Welsh Branch, N.V.M.A., at Aberystwyth, 11.30 a.m.

May 4th.—Meeting of the Biochemical Society at Oxford (University Museum), 2 p.m.

May 7th.—R.C.V.S. Animal Management Examinations, commencing in London.

May 7th.—R.C.V.S. Council Elections—Last date for Nominations.

May 11th.—Annual Meeting of the Association of Veterinary Inspectors, at Friends' House, Euston Road, N.W.1, 2 p.m.

May 15th.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Colchester, 2.15 p.m.

May 21st.—R.C.V.S. Council Elections—Voting Papers issued.

May 28th.—R.C.V.S. Council Elections—Voting Papers to be returned.

June 4th.—R.C.V.S. Annual General Meeting.

June 4th.—R.C.V.S. Committee Meetings.

June 5th.—R.C.V.S. Committee Meetings.

June 6th.—R.C.V.S. Committee and Council Meetings.

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R.C.V.S. Council Election

Addresses of Candidates

The addresses of candidates for election to Council, R.C.V.S., will be published in our issue of May 18th. Those who desire to submit such addresses for publication are requested to note that they must be received by the Editorial Representative, N.V.M.A., 36, Gordon Square, London, W.C.1, not later than Monday, May 6th, and that they must be limited to 250 words.

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R.C.V.S. OBITUARY

McIntosh, John W., M.R.C.V.S., F.R.S.E., Past President, R.C.V.S. and N.V.M.A., of Cairngower, Crieff, Perthshire. Graduated Edinburgh, May 24th, 1893. Died April 15th, 1946. A memoir appears in another column.

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The Late Mr. Frank Talbot, M.R.C.V.S.

In reference to the late Mr. J. Frank Talbot, of Tuxford, whose death we recorded with much regret in our issue of last week, the *Retford, Times* states that by his passing a 160-year-old family connection as veterinary surgeons in the North Notts area has come to an end. The tribute proceeds: "It is known that Mr. Talbot's great great grandfather was a veterinary surgeon at Tuxford, and the practice had been handed down from father to son since that date, being carried on by Mr. Frank Talbot himself for almost 50 years.

"Mr. Talbot was a sportsman in the finest sense of the word, and he was a well-known rider to hounds, both with the Rufford and Grove hunts. For over 30 years he was playing captain of the Tuxford Newcastle Cricket Club, resigning from that position in 1938. He was always particularly proud of the fact that he was the only man ever to score more than a century on the club's ground. A really keen cricketer, he had played on practically every ground within a wide radius during his 50 years of active cricketing.

"Among his many other activities, Mr. Talbot was from 1914 until 1938 Inspector of the Special Constabulary at Tuxford. Apart from his collegiate days, Mr. Talbot had the remarkable record of never having lived at any other residence than his home at Tuxford, not even having been away on a single holiday."

PERSONAL

Birth.—Wilkins.—To Margaret Clare (*née* Lyons), wife of Major J. M. Wilkins, R.A.V.C., of Southstoke, Bath, on April 8th, 1946, at Ormonde Lodge Nursing Home, Bath—a son.

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At the recent election of Councillors for the Whitchurch (Salop) Urban District Council, Mr. R. E. S. Tuckey, M.R.C.V.S., was returned at the head of the poll. With 1,778 votes out of 2,120 recorded and 838 votes above the next successful candidate (there were eleven candidates) his achievement creates a record for the town.

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Congratulations to F. W. Deas, the veterinarian Heriot, upon leading Scotland to runaway victory over England in Saturday's match at Murrayfield.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Norfolk.—Cottage Farm Allotments, Plumstead Road, Thorpe, Norwich, Norfolk (Apr. 11th).

Berks.—Small Holding, 123, Upper Road, Kennington, Abingdon, Berks. (Apr. 13th).

Lanarks.—Mill Road Farm, Yoker, Glasgow, Lanarks. (Apr. 13th).

Leics.—11, Leicester Road, Narborough, Leics. (Apr. 13th).

Hunts.—Smith's Premises, Peterborough Road, Elton, Peterborough, Northants. (Apr. 13th).

Notts.—Harrison's Row, St. Peter Street, Radford, Nottingham (Apr. 12th).

Staffs.—7, Greenfield Avenue, Cradley Heath, Staffs. (Apr. 13th).

Yorks., E.R.—Walkington, Beverley, Yorks. (Apr. 13th).

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Special Meeting of Council, R.C.V.S.: A Correction.—We regret that, owing to a reporter's error, the remarks made by Mr. Esmond Brown at the special meeting of Council, R.C.V.S. on veterinary education held on January 10th, and reproduced on page 39 of our *Supplement* of April 6th, were wrongly attributed to Professor T. J. Bosworth.

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

Following is the Pass List for the March, 1946, University of London B.Sc. (Veterinary Science) Examination: Arnold, Geoffrey Keeble; Biggers, John Dennis; King, Anthony Stuart. All are of the Royal Veterinary College.

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RELEASE OF R.A.V.C. OFFICERS

The War Office announces the following further release of officers of the R.A.V.C., excluding Quartermasters: Group 42 and 43 from May 1st to May 15th; Group 44 and 45 from May 16th to May 31st; Group 46 and 47 from June 1st to June 15th.

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Owing to the great shortage of glass and glass bottles, all veterinary surgeons are urgently requested to return all bottles, especially those used for biologicals, to the laboratory from which they came. This applies particularly to vaccine and tuberculin bottles.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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VETERINARY EDUCATION

Sir,—A leading article in *The Times* of April 2nd was devoted to "Veterinary Training." It referred to the Minister of Agriculture's statement that the Government had accepted broadly the recommendations of the two committees which have been considering veterinary education and the control of unregistered practitioners. The leader emphasized the pressing need for more well trained veterinary surgeons and in conclusion said:—

> "The Minister's statement marks a step forward; it should be quickly followed by an announcement of plans, for the systematic clearance, area by area, of such bovine diseases as tuberculosis and contagious abortion. Certainly there is plenty of work ahead for the entrant into the veterinary profession."

This leader reflects the lay opinion formed during the past three to four years by the references to veterinary education and the reiterated propaganda of the Veterinary Educational Trust that have appeared in the Press, and the inference or conclusion that may be drawn from it is that many more well trained veterinary surgeons are required if we are to progress in the control of the more important animal diseases, especially tuberculosis and contagious abortion.

Future plans for the control of tuberculosis will rest on an extended use of the tuberculin test, while the clearance of contagious abortion will necessitate field operations equally simple.

The practitioner with a wide range and variety of veterinary interests may not suffer professionally by devoting a proportion of his time to routine tuberculin testing and comparable duties. It is otherwise with the veterinary officer when the greater part of his work consists of routine that makes no serious demand on his professional training.

If the standard of veterinary education and the status of the profession are to be raised has not the time arrived to consider the use of lay staff under veterinary direction for the performance of some of the routine tasks in the field? The multiplication of trained veterinary surgeons employed on duties that can be performed satisfactorily by lay assistants will eventually lower the status of the veterinary surgeon and is fraught with danger to the profession which cannot be avoided by raising the quality of the veterinary training.

Yours faithfully,

Animal Diseases Research Association, A. D. McEwen.
Moredun Institute,
Gilmerton, Midlothian.
April 9th, 1946.

. . . . .

Sir,—The Supplement to *The Veterinary Record*, dated April 6th, containing the melancholy narrative of the proceedings in Council, R.C.V.S., on November 20th and January 10th last, which ultimately led, despite the backing given to it by the profession at last year's R.C.V.S. Election, to the craven capitulation of that body to Ministerial insistence on compliance with the main recommendations in the Second (*not* the First) Loveday Report, is redeemed, in my submission, by three—and almost only three—statements which will give the majority of the profession cause for a measure of continued confidence in some of its several Councillors when they seek re-election:—

1. In the "Draft note of a meeting between the Minister and the Royal College of Veterinary Surgeons" which took place on November 28th, 1945, Dr. Hare (a member of the deputation) is reported to have, quite properly, "*suggested* [to the Minister] *that the proposed power of inspection* [by the reconstituted R.C.V.S. Council over the University teaching centres] *was worth nothing. It existed in the medical sphere and had proved futile. What was wanted was to ensure that the universities understood the fundamentals of veterinary education. . . .*"

2. In the discussion in Council, on January 10th, upon the safeguards to be retained by it, as reconstituted, in the matter of awarding "authorization" to the universities to grant registrable degrees, Mr. Esmond Brown said: "*What could be read into this reluctance on the part of the universities? That seems to be very important. I am not a business man, or a politician, or even an experienced member of this Council, but on reading the report of the delegation, there does not seem to be a single concession that is worth having, or even an indication of one. . . .*"

3. Riposting to an extraordinary suggestion on the part of Professor J. G. Wright afterwards that, to appreciate the situation as it had developed, "*all the schools will want is a copy of the Loveday Report and a copy of that*" (presumably the report upon the deputation to the Ministry), Professor Buxton, with good sense and great justice, rightly said: "*To say that the schools would simply want a copy of the Loveday Report and that document is, I think, most reprehensible. I am astounded. Surely the schools are entitled to a little preamble. At present they know nothing. Is it really suggested that they are not to be given one word of introduction, to put them wise as to what has happened, which has led up to* THIS EXTRAORDINARY POSITION *we have reached to-day? I really am astonished.*" [My italics or s.caps, throughout.]

Not until the proceedings of the Special Meetings of Council, held as far back as November 20th and January 10th last (from which the above extracts are taken) were made generally available to the profession, were Fellows and members made fully sensible of the present "EXTRAORDINARY POSITION" as well as in whom of their Councillors faith can still be reposed to defend to the last their cause and their privileges.

Voting papers for the coming (May 21st) R.C.V.S. Elections have already been despatched overseas. It will therefore remain all the more a stern duty of all home voters (to whom the above proceedings are now available, as they were not available in time to their colleagues overseas) to make certain that their own judgment is exercised and recorded without fail.

By such means they cannot help but arrive at a fair decision upon the responsibility for this grave position in which all of us now find ourselves—a position, be it said, at once humiliating, no less than extraordinary—and so ensure that never more shall its perpetrators be vested with authority to speak on their behalf.

Yours faithfully,

University of London Club, J. T. Edwards.
21, Gower Street, W.C.1.
April 9th, 1946.

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ADVERTISERS' ANNOUNCEMENT

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